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# Department of Water Supply, Gas and Electricity

# ANNUAL REPORT
1908

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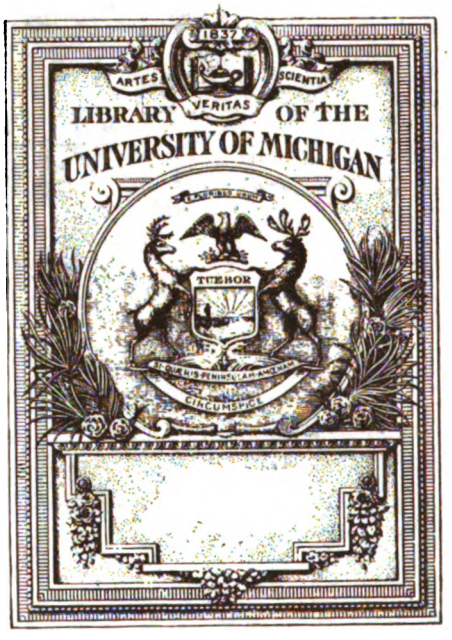


THE GIFT OF
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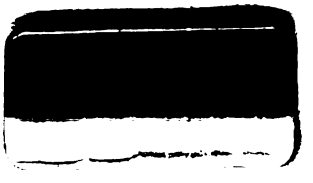

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# ANNUAL REPORT

OF THE

# Department of Water Supply, Gas and Electricity

OF

# THE CITY OF NEW YORK.

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1908.

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# DEPARTMENT OF WATER SUPPLY GAS AND ELECTRICITY.

## REPORT FOR THE YEAR 1908.

Department of Water Supply, Gas and Electricity,
Nos. 13 to 21 Park Row,
New York, August 27, 1909.

Hon. GEORGE B. McCLELLAN, Mayor:

Sir—Pursuant to the requirements of section 1554 of the amended Charter, I transmit herewith report of the transactions of this Department for the year ending December 31, 1908.

The average daily consumption of water for the Boroughs of Manhattan and The Bronx was three hundred and twenty-seven million gallons, which was, approximately, two million gallons less than the preceding year. The rainfall for the year on the Croton watershed was 43.02 inches, which was very near the average, although about 17 inches less than in 1907. The reduction in the consumption of water I believe is due, principally, to the close inspection of all plumbing fixtures and the prompt repair of all defects; also to the installation of water meters.

No argument seems necessary to prove the necessity for reducing leakage, and the Department could have accomplished a great deal in this direction if the money had been authorized to carry on investigation and inspection as provided by the Stanley Act, chapter 611 of the Laws of 1906. Several requisitions were made for the necessary funds to carry on this important work, but no action has yet been taken by the Board of Estimate and Apportionment. It was contemplated to measure the flow of water through the meters; to conduct examinations to determine the illegal use of water, if any; to conduct a house to house inspection, and to install meters in distinct sections of the City to ascertain accurately the consumption of

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water in the tenement, hotel, and residental sections. The usual work of repairs was carried on on the watershed. A strict sanitary patrol was maintained and with the co-operation of the State Department of Health all nuisances conflicting with the public health laws were abated. The necessity for an early filtration of the water supply is manifest by the increase in the number of typhoid cases in the spring which, so far as the records of the Department show, is the only year in which such a rise has occurred.

By a special act of the Legislature the Village of Mount Kisco was authorized to issue bonds for the construction of a complete system of sewage and The City of New York agreed to dispose of it. The work on the sewage system was started in August and continued until the fall of the year. Plans for the construction of the disposal plant have been completed and contracts prepared, and work will be started as soon as title to the land upon which the plant will be located vests in the City.

Distribution System, Manhattan and The Bronx.

Considerable improvement has been effected in the distribution system. Some 200,000 feet of new mains have been laid and 1,100 new hydrants installed. A careful examination of all the hydrants was made to determine their efficiency, and the Fire Department was furnished with charts to show the exact location of those hydrants capable of yielding 600 gallons per minute, or more. A comprehensive plan for the remodelling of the distribution system was started, which comprised careful investigation of the normal pressures throughout the City with a view to their equalization so far as practicable, and also the determination of the flow through the most important trunk mains so that the flow may be properly proportioned. Arrangements have been made for the subdivision of the districts covered by our repair gangs which, owing to their large area, cannot be properly served at present.

At my direction Deputy Commissioner M. F. Loughman has conducted a number of tests on the use of cheaper grades of coal, and it has been satisfactorily established by these tests that the Department coal bills for 1909 will be upwards of $150,000 less than in previous years. The first change in the grade of coal was in the use of broken size, which costs less than the grade which the Department had been using. In the first contract let for this grade of coal the Department saved about $12,000. The following table, giving the results of the tests of the different grades of coal, is very interesting and clearly shows what the Department has already accomplished in this direction and the large saving in the cost of coal in the future operations of the stations:

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Comparative Statement, Based on Pumping Twenty-five Thousand Million Gallons Yearly.

| | Amount of Water Pumped, Million Gallons. | Cost Per Million Gallons. | Coal, Gross Tons. | Cost Per Gross Ton. | Total Cost. |
|---|---|---|---|---|---|
| Egg coal | 25,000 | $3 83 | 17,470 | $5 48 | $95,750 00 |
| Broken coal | 25,000 | 3 54 | 18,280 | 4 84 | 88,500 00 |
| Decrease | ..... | $0 29 | ..... | $0 64 | ..... |
| Increase | ..... | ..... | 810 | ..... | ..... |
| Egg coal | 25,000 | $3 83 | 17,470 | $5 48 | $95,750 00 |
| Buckwheat, No. 1 | 25,000 | 2 24 | 18,320 | 3 10 | 56,000 00 |
| Decrease | ..... | $1 69 | ..... | $2 38 | $39,750 00 |
| Increase | ..... | ..... | 950 | ..... | ..... |
| Broken coal | 25,000 | $3 54 | 18,280 | $4 84 | $88,500 00 |
| Buckwheat, No. 1 | 25,000 | 2 24 | 18,320 | 3 10 | 56,000 00 |
| Decrease | ..... | $1 30 | ..... | $1 74 | $32,500 00 |
| Increase | ..... | ..... | 40 | ..... | ..... |

The contracts for the installation of the high pressure system in the Borough of Manhattan were completed early in the year, and after a series of exhaustive tests, followed by a public exhibition on June 27, when the entire system was put in operation, the system was officially put into service on July 6, at 8 a. m., and has continued in operation since then with most satisfactory results. Many of the leading officers of the Fire Department and a number of citizens and delegations from the underwriters were present, and the Department was highly complimented on both the design and construction of the system. The high pressure mains were completed in seventeen working months, averaging at the rate of 17,500 feet per month. The daily rate sometimes reached 1,400 feet. These mains were hauled, laid, and tested in many of our crowded streets, heavily congested with traffic, and the contractor met with indescribable difficulties at many points by the presence of numerous subsurface structures, many of which were unrecorded and unknown, yet the work was done with record speed and completed well within the Department estimates and appropriations. Following the completion and operation of this system the New York Fire Exchange reduced their insurance rates within the protected district about $500,000 per annum.

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A further appropriation has been authorized for the extension of this system into other districts.

BOROUGH OF BROOKLYN.

The per capita consumption was 97.10 gallons, representing an averaged daily consumption of 141,623,705 gallons. On February 4 the highest consumption of the year was recorded, 161,320,000 gallons. The work of developing the supply from underground sources continued vigorously during the year. A great deal of work was done by the Department driven well gangs, resulting in an increased yield from various stations, especially at Oconee, Valley Stream and Clear Stream. Contracts for driving deep and shallow wells were completed and the wells connected up and put into service during the year. The construction of three pumping stations at Smiths Pond, Clear Stream and Valley Stream was started. Contractor Titus completed the first of the two stations from which he will pump direct into the distributing mains, and beginning at an average delivery of 1,700,000 gallons in January, increased by December to 5,100,000 gallons. Good progress was made by Mr. Titus upon the installation of his second plant at Forest Stream. The delivery of this water will be through a 30-inch main, connecting with the station and the distributing pipe at Myrtle and Cypress avenues. The 72-inch pipe line was continued in service as an auxiliary of the old brick conduit. Contracts, plans, etc., for the extension of this line from Valley Stream to Amityville were completed and signed and the Board of Estimate and Apportionment approved of the maps describing the property through which said pipe line would pass. Title to the lands vested in the City on December 15, 1908, on the filing of the oaths of the Commissioners of Appraisal appointed by the Courts in these proceedings. The infiltration galleries constructed at Massapequa and Wantagh were completed and accepted by the City and have been in regular operation since.

A large corps of Engineers and Assistants have been making extensive surveys and assisting the Corporation Counsel's office in preparing data for the defense of suits brought against the City by owners of property along the watershed for the diversion of water by the operation of the several stations.

During the year applications were received for the laying of water mains in 272 streets and avenues. Work under existing pipe laying contracts continued actively. In all emergency cases the pipe lines were extended and hydrants installed by the Department employees. In the southern and western sections of the Borough, which are now being rapidly built up, the Department has provided contracts for the extension of mains and the installation of a large number of hydrants.

The work on the main and reserve high pressure fire service stations was completed and in August the Fire Department was officially notified that the Department was ready to respond to calls for high pressure service.

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As a result of the efforts of the Department in the removal of overhead wires, 1,165 miles of aerial electric, telephone, and telegraph wires were placed in subways, and 1,386 poles removed from the highways.

BOROUGH OF QUEENS.

Plans, specifications and contracts have been prepared for the much needed extension of the distribution system which will greatly increase the efficiency of the supply, both for domestic consumption and fire protection. Preliminary plans have been prepared for the laying of a main which will enable the Department to secure an additional supply from the Great Neck and Douglaston stations, operated by the Citizens' Water Supply Company. A full and exhaustive report was made by the Chief Engineer in regard to the various sources of supply in the Borough of Queens, and particularly as to conditions existing in Long Island City. In view of the facts established by his report I recommended to the Board of Estimate and Apportionment the advisability of acquiring the works and franchises of the Citizens' Water Supply Company, provided this could be done at a reasonable and fair valuation. From an averaged daily supply of approximately 12,200,000 gallons furnished to the First, Second and Third Wards, less than one-half was furnished by the stations operated by the City.

BOROUGH OF RICHMOND.

The Corporation Counsel had practically completed his examination into the title and interests of the plants, franchises, etc., of the Staten Island and Crystal Water Supply Companies, the purchase of which had been authorized by the Board of Estimate and Apportionment. The Department authorized and supervised the construction of several new boilers which were installed in the water companies' plants, and approved of the extension of the distribution systems, agreeing to reimburse the companies for the actual expense incurred in addition to the amount already agreed upon for the companies' plants, etc. Several new wells were driven at the Tottenville station and a 2,000,000-gallon pumping engine was set and connected up with the reservoir on the grounds. The pumping appliances were repaired when necessary and all defective parts replaced. Eight miles of new mains were laid under the contract of Daly & McBean, and many of the old style, ineffective hydrants were replaced with others of modern pattern.

Collections.

The total revenue from the sale of water and other sources, including the unpaid charges transmitted for collection to the Bureau of Arrears, was $11,221,239.59, representing an increase over 1907 of $560,280.07.

During the year 1908 a law was enacted known as chapter 382, which corrected a defect in one of the charter provisions relating to the rendering of water meter bills. There has always been some doubt as to the right of the Department to charge a building in which a water meter was located for water which was not indicated by the meter, owing to some defect in the mechanism. This law has been of great assist-

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ance to the Department in adjusting and rendering meter bills and it has lessened the opportunity for complaints, which have always been a source of great annoyance. By strict enforcement of the Department regulations the period of time in which the meters have been inactive has been considerably reduced. The average is about 100 days as compared to several years in previous times. The Department has vigorously pursued the enforcement of the metering of all business establishments.

Lamps and Lighting, Electrical Inspection.

Complete appliances for a new arrangement of lighting the boulevard streets as exists on Seventh avenue and Broadway at present have been adopted, and preliminary arrangements for the relocation and installation of additional lamps on Fifth avenue have been completed. In many of the suburban districts the Department has introduced the Tungsten incandescent lamps as a substitute for the Welsbach gas lamps, bringing to the City for the first time a successful competitor of the gas mantle lamp. It is one of the most convenient methods of lighting in suburban districts where there are comparatively few gas mains and where the writing is all overhead. After a campaign of some two years the Department has finally secured from the Richmond Light and Railroad Company a satisfactory agreement for the relighting and repair of the lighting lines. The extension of street lighting has exceeded any previous year's work and complaints of unlighted streets are becoming less frequent. The steady increase in the cost of lighting public buildings makes it necessary for the employment of a larger force of men to supervise and direct the proper distribution of the lighting of these buildings in an endeavor to keep within the lines of economy. The Bureau of Electrical Inspection has been placed under the same supervision as that of the Bureau of Lamps and Lighting. These bureaus naturally should be operated together as they control practically the electrical practice and lighting throughout the City. All new electrical appliances are submitted for test to the Board of Engineers, consisting of the Chief of the Bureau, the Assistant Engineer and the Consulting Electrical Engineer.

Arrangements have been made with the Fire Underwriters for the responsibility and approval of the installation of electrical wiring in the smaller buildings in the City, the Department to devote its inspections mainly to buildings involving not only a fire hazard but a life hazard. The amusement houses and buildings where large assemblages of people congregate are now being carefully inspected for electrical defects. In many of the buildings owned by the municipality the electrical wiring is not in proper shape and in some of the buildings it is quite dangerous. The departments having jurisdiction of the care and maintenance of these buildings have been notified of the need of remedying the conditions.

I attach the individual reports of the several Deputy Commissioners and Bureau heads, in which is embodied a detailed record of all the work accomplished by the Department in the different branches of the service.

Respectfully submitted,

JOHN H. O'BRIEN, Commissioner.

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## OFFICE OF CHIEF ENGINEER.

Department of Water Supply, Gas and Electricity
Office of Chief Engineer, Nos. 13 to 21 Park Row,
City of New York, March 15, 1909.

Hon. JOHN H. O'BRIEN, Commissioner:

Sir—I beg to report herewith on the condition of the water supply in the Boroughs of Manhattan, The Bronx and Queens, for the year ending December 31, 1908; work done during the year on the supply and distribution systems, expenditures provided for under the Tax Levy Budget, as well as under the appropriations made by Bond Issue and balances remaining December 31, 1908.

Expenditures.

BOROUGHS OF MANHATTAN AND THE BRONX.

Appropriations of 1908.

| | | |
|---|---|---|
| General Administration, Taxes— | | |
| Appropriation | $40,000 00 | |
| Expended | 24,055 97 | |
| Balance, January 1, 1909 | | $15,944 03 |
| Administration, Salaries, Office of Chief Engineer— | | |
| Appropriation | $26,750 00 | |
| Expended | 23,536 86 | |
| Balance, January 1, 1909 | | $3,213 14 |
| Collection and Storage, Croton Water System, Watersheds, Aqueducts, Ponds and Reservoirs— | | |
| Salaries and Wages: | | |
| Appropriation | $168,000 00 | |
| Expended | 155,422 71 | |
| Balance, January 1, 1909 | | $12,577 29 |
| Horses and Carts: | | |
| Appropriation | $32,000 00 | |
| Expended | 26,915 49 | |
| Balance, January 1, 1909 | | $5,084 51 |

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Collection and Storage, Croton Water System, Watersheds, Aqueducts, Ponds and Reservoirs—

Repairs and Renewals, Materials and Contracts:

| | | |
|---|---|---|
| Appropriation | $10,500 00 | |
| Expended | 4,282 76 | |
| Balance, January 1, 1909 | | $6,217 24 |

Pumping Stations:

Salaries and Wages:

| | | |
|---|---|---|
| Appropriation | $125,060 60 | |
| Expended | 124,801 13 | |
| Balance, January 1, 1909 | | $259 47 |

Horses and Carts:

| | | |
|---|---|---|
| Appropriation | $6,405 00 | |
| Expended | 6,294 00 | |
| Balance, January 1, 1909 | | $111 00 |

Repairs and Renewals:

| | | |
|---|---|---|
| Appropriation | $18,000 00 | |
| Expended | 15,556 64 | |
| Balance, January 1, 1909 | | $2,443 36 |

Bronx River System, Watersheds, Aqueducts, Ponds and Reservoirs—

Salaries and Wages:

| | | |
|---|---|---|
| Appropriation | $29,000 00 | |
| Expended | 24,391 50 | |
| Balance, January 1, 1909 | | $4,608 50 |

Horses and Carts:

| | | |
|---|---|---|
| Appropriation | $6,000 00 | |
| Expended | 6,000 00 | |
| Balance, January 1, 1909 | | ..... |

Repairs and Renewals:

| | | |
|---|---|---|
| Appropriation | $30 00 | |
| Expended | ..... | |
| Balance, January 1, 1909 | | $30 00 |

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| | | |
|---|---|---|
| **Distribution—** | | |
| Maintenance, Manhattan and The Bronx: | | |
| Salaries and Wages: | | |
| Appropriation | $250,000 00 | |
| Transfer | 15,000 00 | |
| | $265,000 00 | |
| Expended | 262,867 38 | |
| Balance | | $2,132 62 |
| Horses and Carts: | | |
| Appropriation | $60,000 00 | |
| Transfer | 5,000 00 | |
| | $65,000 00 | |
| Expended | 65,000 00 | |
| Balance | | ..... |
| Croton and Bronx System: | | |
| Repairs and Renewals: | | |
| Appropriation | $90,000 00 | |
| Transfer from | 19,000 00 | |
| | $71,000 00 | |
| Expended | 37,161 88 | |
| Balance | | $33,838 12 |
| Supplies and Contingencies: | | |
| Appropriation | $175,000 00 | |
| Transfer from | 10,000 00 | |
| | $165,000 00 | |
| Expended | 91,285 40 | |
| Balance | | $73,714 60 |
| Drinking Hydrants: | | |
| Appropriation | $4,000 00 | |
| Expended | 2,339 48 | |
| Balance | | $1,660 52 |

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| | | |
|---|---|---|
| Distribution— | | |
| Croton and Bronx System: | | |
| Telephone Service: | | |
| Appropriation | $9,000 00 | |
| Expended | 3,118 86 | |
| Balance | | $5,881 14 |
| High Pressure Fire Service, Manhattan: | | |
| Salaries and Wages: | | |
| Appropriation | $15,516 00 | |
| Transfer | 5,200 00 | |
| | $20,716 00 | |
| Expended | 20,716 00 | |
| Balance | | ..... |
| Maintenance, Repairs and Supplies: | | |
| Appropriation | $10,000 00 | |
| Expended | 6,918 17 | |
| Balance | | $3,081 83 |

Appropriations of 1907.

| | | |
|---|---|---|
| Salaries, Bureau of Chief Engineer— | | |
| Balance, January 1, 1908 | $1,123 36 | |
| Transferred | 1,123 36 | |
| Balance | | ..... |
| Salaries, Croton Water System— | | |
| Balance, January 1, 1908 | $859 40 | |
| Transferred | 800 00 | |
| Balance | | $59 40 |
| Salaries, High Pressure Fire Service— | | |
| Balance, January 1, 1908 | $8,955 65 | |
| Transferred | 8,955 65 | |
| Balance | | ..... |

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| | | |
|---|---|---|
| Maintenance Croton Water System— | | |
| Salaries and Wages: | | |
| Balance, January 1, 1908 | $9 85 | |
| Transferred | 9 85 | |
| Balance | | ..... |
| Repairs and Supplies: | | |
| Balance, January 1, 1908 | $47,792 97 | |
| Transferred | 12,149 38 | |
| | $59,942 35 | |
| Expended | 57,891 17 | |
| Balance | | $2,051 18 |
| Taxes: | | |
| Balance, January 1, 1908 | $39,444 04 | |
| Expended | 32,826 89 | |
| Balance | | $6,617 15 |
| Bronx River Works, Maintenance and Repairs— | | |
| Salaries and Wages: | | |
| Balance, January 1, 1908 | $102 45 | |
| Expended | 30 92 | |
| Balance | | $71 53 |
| Repairs and Supplies: | | |
| Balance, January 1, 1908 | $2,330 71 | |
| Expended | 1,334 48 | |
| Balance | | $996 23 |
| Taxes: | | |
| Balance, January 1, 1908 | $5,796 39 | |
| Expended | 4,464 77 | |
| Balance | | $1,331 62 |
| Public Drinking Hydrants— | | |
| Balance, January 1, 1908 | $704 75 | |
| Expended | 13 43 | |
| Balance | | $691 32 |

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|---|---|---|
| Repairing and Renewal of Pipes, etc.— | | |
| Salaries and Wages: | | |
| Balance, January 1, 1908 | $10 22 | |
| Expended | ..... | |
| Balance | | $10 22 |
| Repairs and Supplies: | | |
| Balance, January 1, 1908 | $635 29 | |
| Expended | 623 60 | |
| Balance | | $11 69 |
| Water Supply for the Twenty-fourth Ward— | | |
| Balance, January 1, 1908 | $942 20 | |
| Expended | ..... | |
| Balance | | $942 20 |
| Maintenance, High Pressure Fire Service— | | |
| Balance, January 1, 1908 | $5,700 00 | |
| Expended | 2,427 50 | |
| Balance | | $3,272 50 |

Appropriations of 1906.

| | | |
|---|---|---|
| Salaries, Bureau of Chief Engineer— | | |
| Balance, January 1, 1908 | $20 08 | |
| Expended | ..... | |
| Balance | | $20 08 |
| Salaries, Croton Water System— | | |
| Balance, January 1, 1908 | $32 65 | |
| Expended | ..... | |
| Balance | | $32 65 |
| Maintenance, Croton Water System— | | |
| Balance, January 1, 1908 | $116 15 | |
| Expended | 44 60 | |
| Balance | | $71 55 |

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| | | |
|---|---|---|
| Bronx River Works, Maintenance and Repairs— | | |
| Balance, January 1, 1908 | $0 67 | |
| Expended | ..... | |
| Balance | | $0 67 |
| Public Drinking Hydrants— | | |
| Balance, January 1, 1908 | $433 39 | |
| Expended | ..... | |
| Balance | | $433 39 |
| Repairing and Renewal of Pipes, etc.— | | |
| Balance, January 1, 1908 | $2,698 37 | |
| Expended | 69 28 | |
| Balance | | $2,629 09 |

Appropriations of 1905.

| | | |
|---|---|---|
| Bronx River Works, Maintenance and Repairs— | | |
| Balance, January 1, 1908 | $1,787 94 | |
| Expended | 1 45 | |
| Balance | | $1,785 49 |
| Public Drinking Hydrants— | | |
| Balance, January 1, 1908 | $99 55 | |
| Expended | ..... | |
| Balance | | $99 55 |
| Repairing and Renewal of Pipes, etc.— | | |
| Balance, January 1, 1908 | $1,356 82 | |
| Expended | ..... | |
| Balance | | $1,356 82 |

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Appropriations of 1904.

| | | |
|---|---|---|
| Bronx River Works, Maintenance and Repairs— | | |
| Balance, January 1, 1908 | $2,887 53 | |
| Expended | 20 44 | |
| Balance | | $2,867 09 |
| Repairing and Renewal of Pipes, etc.— | | |
| Balance, January 1, 1908 | $3,489 94 | |
| Expended | ..... | |
| Balance | | $3,489 94 |

Appropriations of 1903.

| | | |
|---|---|---|
| Bronx River Works, Maintenance and Repairs— | | |
| Balance, January 1, 1908 | $5,521 74 | |
| Expended | ..... | |
| Balance | | $5,521 74 |
| Maintenance Croton Water System— | | |
| Balance, January 1, 1908 | $8,183 78 | |
| Expended | ..... | |
| Balance | | $8,183 78 |

Appropriations of 1902.

| | | |
|---|---|---|
| Bronx River Works, Maintenance and Repairs— | | |
| Balance, January 1, 1908 | $1,893 89 | |
| Expended | ..... | |
| Balance | | $1,893 89 |
| Maintenance Croton Water System— | | |
| Balance, January 1, 1908 | $17,738 01 | |
| Expended | ..... | |
| Balance | | $17,738 01 |

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## Bond Accounts.

### BOROUGHS OF MANHATTAN AND THE BRONX.

| | | | |
|---|---|---|---|
| Water Fund, Manhattan and The Bronx— | | | |
| Balance, January 1, 1907 | | $2,801,071 13 | |
| Expended: | | | |
| Contracts | $698,126 81 | | |
| Sundries | 11,132 20 | | |
| Salaries | 246,532 21 | | |
| | | 955,791 22 | |
| | | $1,835,279 91 | |
| Outstanding Liabilities: | | | |
| Contracts | | 788,125 64 | |
| Balance | | | $1,047,154 27 |
| Additional Water Fund of The City of New York— | | | |
| Balance, January 1, 1907 | | $28,569 72 | |
| Expended | | 2,660 33 | |
| Balance | | | $25,909 39 |
| Water Mains, Southern Boulevard, near One Hundred and Forty-second Street— | | | |
| Balance, January 1, 1908 | | $3,299 09 | |
| Expended | | ..... | |
| Balance | | | $3,299 09 |
| Erection of Drinking Fountains, The Bronx— | | | |
| Balance, January 1, 1908 | | $650 00 | |
| Expended | | ..... | |
| Balance | | | $650 00 |
| Revenue Bond Fund for Emergency Force— | | | |
| Balance, January 1, 1908 | | $5,224 28 | |
| Expended | | ..... | |
| Balance | | | $5,224 28 |

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| | | | |
|---|---|---|---|
| Revenue Bond Fund for Prevailing Rate of Wages to Enginemen, Manhattan and Queens— | | | |
| Balance, January 1, 1908 | | $90 00 | |
| Expended | | ..... | |
| Balance | | | $90 00 |
| Acquisition of Land for Building Sewers, Mt. Kisco— | | | |
| Balance, January 1, 1908 | | $100,000 00 | |
| Expended | | 3,675 00 | |
| Balance | | | $96,325 00 |
| Erection of Sewage Disposal Plant, Mt. Kisco | | | $86,250 00 |
| Construction, etc., High Pressure Fire System— | | | |
| Balance, January 1, 1908 | | $938,669 56 | |
| Expended: | | | |
| Salaries | $43,599 75 | | |
| Sundries | 48,139 71 | | |
| Contracts | 351,862 64 | | |
| | | 443,602 10 | |
| | | $495,067 46 | |
| Outstanding Liabilities: | | | |
| Contracts | $411,302 64 | | |
| Sundries | 3,180 00 | | |
| | | 414,482 64 | |
| Balance | | | $80,584 82 |
| Selecting Site for Filter Plant and Preparing Plans and Specifications— | | | |
| Balance, January 1, 1908 | | $1,009 88 | |
| Expended | | 397 62 | |
| | | $612 26 | |
| Outstanding liabilities | | 572 98 | |
| Balance | | | $39 38 |

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| | | |
|---|---|---|
| Water Main Fund No. 3— | | |
| Balance, January 1, 1908 | $1,499 02 | |
| Expended | ..... | |
| Balance | | $1,499 02 |
| Revenue Bond Fund for Salaries of Caulkers— | | |
| Balance, January 1, 1908 | $7,276 00 | |
| Expended | 5,250 00 | |
| Balance | | $2,026 00 |
| Revenue Bond Fund for Salaries of Machinists— | | |
| Balance, January 1, 1908 | $1,165 00 | |
| Expended | ..... | |
| Balance | | $1,165 00 |
| Revenue Bond Fund for High Pressure Fire Service— | | |
| Salaries and Wages | $2,000 00 | |
| Expended | 1,064 85 | |
| Balance | | $935 15 |
| Revenue Bond Fund for Bronx River System— | | |
| Horses and Carts | $250 00 | |
| Expended | 151 00 | |
| Balance | | $99 00 |
| Revenue Bond Fund for Pumping Stations— | | |
| Salaries and Wages | $2,500 00 | |
| Expended | 2,258 31 | |
| Balance | | $241 69 |
| Revenue Bond Fund for Maintenance, Manhattan and The Bronx— | | |
| Horses and Carts | $500 00 | |
| Expended | 199 19 | |
| Balance | | $300 81 |

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| Appropriation Accounts. | |
|---|---|
| General Administration, Taxes..... | |
| Administration, Salaries, Office of Chief Engineer..... | |
| Salaries, Office of Chief Engineer, 1906..... | |
| Collection and Storage, Croton Water System— | |
| Watersheds, Aqueducts, Ponds and Reservoirs: | |
| Salaries and Wages..... | |
| Horses and Carts..... | |
| Repairs and Renewals, Materials and Contracts..... | |
| Pumping Stations: | |
| Salaries and Wages..... | |
| Horses and Carts..... | |
| Repairs and Renewals..... | |
| Bronx River System, Watersheds, Aqueducts, Ponds and Reservoirs: | |
| Salaries and Wages..... | |
| Horses and Carts..... | |
| Repairs and Renewals..... | |
| Distribution— | |
| Maintenance, Manhattan and The Bronx: | |
| Salaries and Wages..... | |
| Horses and Carts..... | |
| Croton Water System: | |
| Repairs and Renewals..... | $90,000 00 |
| Transferred ..... | 19,000 00 |
| Supplies and Contingencies..... | $175,000 00 |
| Transferred ..... | 10,000 00 |
| Drinking Hydrants..... | |
| Telephone Service..... | |
| High Pressure Fire Service..... | $15,516 00 |
| Transfer ..... | 5,200 00 |
| Maintenance, Repairs and Supplies..... | |
| Maintenance of Croton Water System, Taxes, 1907..... | |
| Maintenance of Croton Water System, 1906..... | |
| Maintenance of Croton Water System, 1903..... | |
| Maintenance of Croton Water System, 1902..... | |
| Bronx River Works, 1907— | |
| Salaries and Wages..... | |
| Repairs and Supplies..... | |
| Taxes ..... | |

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of Manhattan and The Bronx.

| Funds with Transfers Available in 1908. | Expended in 1908. | Cash Balance, January 1, 1909. | Estimated Liabilities, January 1, 1909. | Estimated Balance, January 1, 1909. |
|---|---|---|---|---|
| $40,000 00 | $24,055 97 | $15,944 03 | ..... | ..... |
| 26,750 00 | 23,536 86 | 3,213 14 | ..... | ..... |
| 20 08 | ..... | 20 08 | ..... | ..... |
| 168,000 00 | 155,422 71 | 12,577 29 | ..... | ..... |
| 32,000 00 | 26,915 49 | 5,084 51 | ..... | ..... |
| 10,500 00 | 4,282 76 | 6,217 24 | ..... | ..... |
| 125,060 60 | 124,801 13 | 259 47 | ..... | ..... |
| 6,405 00 | 6,294 00 | 111 00 | ..... | ..... |
| 18,000 00 | 15,556 64 | 2,443 36 | ..... | ..... |
| 29,000 00 | 24,391 50 | 4,608 50 | ..... | ..... |
| 6,000 00 | 6,000 00 | ..... | ..... | ..... |
| 30 00 | ..... | 30 00 | ..... | ..... |
| 265,000 00 | 262,867 38 | 2,132 62 | ..... | |
| 65,000 00 | 65,000 00 | ..... | ..... | ..... |
| 71,000 00 | 37,161 88 | 33,838 12 | ..... | ..... |
| 165,000 00 | 91,285 40 | 73,714 60 | ..... | ..... |
| 4,000 00 | 2,339 48 | 1,660 52 | ..... | ..... |
| 9,000 00 | 3,118 86 | 5,881 14 | ..... | ..... |
| 20,716 00 | 20,716 00 | ..... | ..... | ..... |
| 10,000 00 | 6,918 17 | 3,081 83 | ..... | ..... |
| 39,444 04 | 32,826 89 | 6,617 15 | ..... | ..... |
| 116 15 | 44 60 | 71 55 | ..... | ..... |
| 8,183 78 | ..... | 8,183 78 | ..... | ..... |
| 17,738 01 | ..... | 17,738 01 | ..... | ..... |
| 102 45 | 30 92 | 71 53 | ..... | ..... |
| 2,330 71 | 1,334 48 | 996 23 | ..... | ..... |
| 5,796 39 | 4,464 77 | 1,331 62 | ..... | ..... |

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Appropriation Accounts.

Bronx River Works, 1906.....
Bronx River Works, 1905.....
Bronx River Works, 1904.....
Bronx River Works, 1903.....
Bronx River Works, 1902.....
Public Drinking Hydrants, 1907.....
Public Drinking Hydrants, 1906.....
Public Drinking Hydrants, 1905.....
Repairing and Renewal of Pipes—
Salaries and Wages, 1907.....
Repairs and Supplies.....
Repairing and Renewal of Pipes, etc., 1906.....
Repairing and Renewal of Pipes, etc., 1905.....
Repairing and Renewal of Pipes, etc., 1904.....
Water Supply for the Twenty-fourth Ward, 1907.....
Maintenance, High Pressure Fire Service.....

Total disbursements account appropriations.....

Bond Accounts.

Water Fund, Manhattan and The Bronx.....
Additional Water Fund of The City of New York.....
Water Mains, Southern Boulevard, near One Hundred and Forty-second Street.....
Erection of Drinking Hydrants, The Bronx.....
Construction and Establishment of High Pressure Fire System.....
Selecting Site for Filter Plant, etc.....
Water Main Fund No. 3.....
Acquisition of Land for Building Sewers, Mount Kisco.....
Erection of Sewage Disposal Plant, Mount Kisco.....
Revenue Bond Fund for Emergency Force.....
Revenue Bond Fund for Prevailing Rate of Wages of Enginemen, Manhattan and The Bronx.....
Revenue Bond Fund for Salaries, Caulkers, etc.....
Revenue Bond Fund for Salaries, High Pressure Fire Service.....
Revenue Bond Fund for Horses and Carts, Bronx River System.....
Revenue Bond Fund for Salaries and Wages, Pumping Stations.....
Revenue Bond Fund for Horses and Carts, Maintenance, Manhattan and The Bronx.....

Total disbursements bond accounts.....

Total expended, 1908.....

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| Funds with Transfers Available in 1908. | Expended in 1908. | | Cash Balance, January 1, 1909. | Estimated Liabilities, January 1, 1909. | Estimated Balance, January 1, 1909. |
|---|---|---|---|---|---|
| 67 | ..... | | 67 | ..... | ..... |
| 1,787 94 | 1 45 | | 1,785 49 | ..... | ..... |
| 2,887 53 | 20 44 | | 2,867 09 | ..... | ..... |
| 5,521 74 | ..... | | 5,521 74 | ..... | ..... |
| 1,893 89 | ..... | | 1,893 89 | ..... | ..... |
| 704 75 | 13 43 | | 691 32 | ..... | ..... |
| 433 39 | ..... | | 433 39 | ..... | ..... |
| 99 55 | ..... | | 99 55 | ..... | ..... |
| 10 22 | ..... | | 10 22 | ..... | ..... |
| 635 29 | 623 60 | | 11 69 | ..... | ..... |
| 2,698 37 | 69 28 | | 2,629 09 | ..... | ..... |
| 1,356 82 | ..... | | 1,356 82 | ..... | ..... |
| 3,489 94 | ..... | | 3,489 94 | ..... | ..... |
| 942 20 | ..... | | 942 20 | ..... | ..... |
| 5,700 00 | 2,427 50 | | 3,272 50 | ..... | ..... |
| ..... | | $942,521 59 | | | |
| 2,801,071 13 | $955,791 22 | | 1,835,279 91 | $788,125 64 | $1,047,154 27 |
| 28,569 72 | 2,660 33 | | 25,909 39 | ..... | ..... |
| 3,299 09 | ..... | | 3,299 09 | ..... | ..... |
| 650 00 | ..... | | 650 00 | ..... | ..... |
| 938,669 56 | 443,602 10 | | 495,067 46 | 414,482 64 | 80,584 82 |
| 1,009 88 | 397 62 | | 612 26 | 572 98 | 39 38 |
| 1,499 02 | ..... | | 1,499 02 | ..... | ..... |
| 100,000 00 | 3,675 00 | | 96,325 00 | ..... | ..... |
| 86,250 00 | ..... | | 86,250 00 | ..... | ..... |
| 5,224 28 | ..... | | 5,224 28 | ..... | ..... |
| 90 00 | ..... | | 90 00 | ..... | ..... |
| 7,276 00 | 5,250 00 | | 2,026 00 | ..... | ..... |
| 2,000 00 | 1,064 85 | | 935 15 | ..... | ..... |
| 250 00 | 151 00 | | 99 00 | ..... | ..... |
| 2,500 00 | 2,258 31 | | 241 69 | ..... | ..... |
| 500 00 | 199 19 | | 300 81 | ..... | ..... |
| ..... | | 1,415,046 62 | | | |
| ..... | ..... | $2,357,568 21 | | | |

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BOROUGH OF QUEENS.

Appropriations of 1908.

| | | |
|---|---|---|
| Administration, Office of Deputy Commissioner— | | |
| Salaries and Wages | $6,550 00 | |
| Transferred | 1,000 00 | |
| | $5,550 00 | |
| Expended | 5,550 00 | |
| Balance | | ..... |
| Office of Chief Engineer: | | |
| Salaries and Wages | $3,500 00 | |
| Expended | 3,299 98 | |
| Balance | | $200 02 |
| Collection and Storage, Pumping Stations and Standpipes— | | |
| Salaries and Wages | $52,344 00 | |
| Transfer | 3,706 88 | |
| | $56,050 88 | |
| Expended | 56,050 88 | |
| Balance | | ..... |
| Repairs and Renewals: | | |
| Appropriation | $2,000 00 | |
| Expended | 1,760 87 | |
| Balance | | $239 13 |
| Distribution— | | |
| Water Registration, Permits and Revenue Collections: | | |
| Salaries and Wages | $15,450 00 | |
| Transferred | 700 00 | |
| | $14,750 00 | |
| Expended | 13,949 72 | |
| Balance | | $800 28 |
| Maintenance: | | |
| Salaries and Wages | $28,810 00 | |
| Expended | 28,554 20 | |
| Balance | | $255 80 |

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| | | |
|---|---|---|
| Distribution— | | |
| Pipes, Hydrants and Stop-cocks: | | |
| Appropriation | $4,500 00 | |
| Expended | 887 61 | |
| Balance | | $3,612 39 |
| Fire Hydrant Rentals and Water Purchased: | | |
| Appropriation | $200,000 00 | |
| Expended | 161,008 64 | |
| Balance | | $38,991 36 |
| Supplies and Contingencies: | | |
| Appropriation | $45,000 00 | |
| Expended | 27,281 04 | |
| Balance | | $17,718 96 |

Appropriations of 1907.

| | | |
|---|---|---|
| Salaries, Office of Deputy Commissioner— | | |
| Balance, January 1, 1908 | $2,408 21 | |
| Expended | ..... | |
| Balance | | $2,408 21 |
| Pumping Stations, Fuel and Supplies— | | |
| Balance, January 1, 1908 | $7,649 43 | |
| Expended | 7,518 75 | |
| Balance | | $130 68 |
| Maintenance and Repairs— | | |
| Balance, January 1, 1908 | $3,857 07 | |
| Expended | 3,799 51 | |
| Balance | | $57 56 |
| Supplying Water to Long Island City— | | |
| Balance, January 1, 1908 | $12,867 11 | |
| Expended | 12,867 11 | |
| Balance | | ..... |

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| | | |
|---|---|---|
| Rental of Fire Hydrants— | | |
| Balance, January 1, 1908 | $27,983 04 | |
| Expended | 27,983 04 | |
| Balance | | ..... |

Appropriations of 1906.

| | | |
|---|---|---|
| Salaries, Office of Deputy Commissioner— | | |
| Balance, January 1, 1908 | $1,371 74 | |
| Expended | ..... | |
| Balance | | $1,371 74 |
| Salaries, Pumping Stations— | | |
| Balance, January 1, 1908 | $13 83 | |
| Expended | ..... | |
| Balance | | $13 83 |
| Pumping Stations, Fuel and Supplies— | | |
| Balance, January 1, 1908 | $3,083 61 | |
| Expended | ..... | |
| Balance | | $3,083 61 |
| Rental of Fire Hydrants— | | |
| Balance, January 1, 1908 | $813 02 | |
| Expended | ..... | |
| Balance | | $813 02 |

Appropriations of 1905.

| | | |
|---|---|---|
| Salaries, Office of Deputy Commissioner— | | |
| Balance, January 1, 1908 | $35 29 | |
| Expended | ..... | |
| Balance | | $35 29 |
| Salaries, Pumping Stations— | | |
| Balance. January 1, 1908 | $65 21 | |
| Expended | ..... | |
| Balance | | $65 21 |

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| | | |
|---|---|---|
| Pumping Stations, Fuel and Supplies— | | |
| Balance January 1, 1908 | $352 37 | |
| Expended | ..... | |
| Balance | | $352 37 |
| Maintenance and Repairs of Water Pipes, etc.— | | |
| Balance, January 1, 1908 | $60 33 | |
| Expended | ..... | |
| Balance | | $60 33 |

Appropriations of 1904.

| | | |
|---|---|---|
| Maintenance and Repairs of Water Pipes, etc.— | | |
| Balance, January 1, 1908 | $257 18 | |
| Expended | ..... | |
| Balance | | $257 18 |

Bond Accounts.

BOROUGH OF QUEENS.

| | | | |
|---|---|---|---|
| Water Fund— | | | |
| Balance, January 1, 1908 | | $193,161 69 | |
| Expended: | | | |
| Contracts | $83,728 00 | | |
| Sundries | 16,166 34 | | |
| | | 99,994 34 | |
| | | $93,167 35 | |
| Outstanding Liabilities: | | | |
| Contracts | $5 600 00 | | |
| Sundries | 1,000 00 | | |
| | | 6,600 00 | |
| Balance | | | $86 567 35 |
| Revenue Bond Fund for Laying Water Mains— | | | |
| Balance, January 1, 1908 | | $146 67 | |
| Expended | | ..... | |
| Balance | | | $146 67 |

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| | |
|---|---|
| **Appropriation Accounts.** | |
| Administration, Office of Deputy Commissioner— | |
| Salaries and Wages | $6,550 00 |
| Transferred | 1,000 00 |
| Salaries, Office of Deputy Commissioner, 1907 | |
| Salaries, Office of Deputy Commissioner, 1906 | |
| Salaries, Office of Deputy Commissioner, 1905 | |
| Collection and Storage— | |
| Pumping Stations and Standpipes: | |
| Salaries and Wages | $52,344 00 |
| Transfer | 3,706 88 |
| Repairs and Renewals | |
| Pumping Stations, Fuel and Supplies, 1907 | |
| Pumping Stations, Fuel and Supplies, 1906 | |
| Pumping Stations, Fuel and Supplies, 1905 | |
| Distribution— | |
| Water Registration, Permits and Revenue Collections: | |
| Salaries and Wages | $15,450 00 |
| Transfer | 750 00 |
| Maintenance: | |
| Salaries and Wages, 1908 | |
| Pipes, Hydrants and Stop-cocks | |
| Fire Hydrant Rentals and Water Purchased | |
| Supplies and Contingencies | |
| Maintenance and Repairs, 1907 | |
| Maintenance and Repairs, 1905 | |
| Maintenance and Repairs, 1904 | |
| Supplying Water to Long Island City, 1907 | |
| Rental of Fire Hydrants, 1907 | |
| Rental of Fire Hydrants, 1906 | |
| Total disbursements account appropriations | |
| **Bond Accounts.** | |
| Water Fund, Borough of Queens | |
| Revenue Bond Fund for Laying Water Mains | |
| Total expended during 1908 | |

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ough of Queens.

| Funds Available in 1908. | Expended in 1908. | Cash Balance, January 1, 1909. | Estimated Liabilities, January 1, 1909. | Estimated Balance, January 1, 1909. Estimated |
|---|---|---|---|---|
| $5,500 00 | $5,500 00 | ..... | ..... | ..... |
| 2,408 21 | ..... | $2,408 21 | ..... | ..... |
| 1,371 74 | ..... | 1,374 74 | ..... | ..... |
| 35 29 | ..... | 35 29 | ..... | ..... |
| 56,050 88 | 56,050 88 | ..... | ..... | ..... |
| 2,000 00 | 1,760 87 | 239 13 | ..... | ..... |
| 7,649 43 | 7,518 75 | 130 68 | ..... | ..... |
| 3,083 61 | ..... | 3,083 61 | ..... | ..... |
| 352 37 | ..... | 352 37 | ..... | ..... |
| 14,750 00 | 13,949 72 | 800 28 | ..... | ..... |
| 28,810 00 | 28,554 20 | 255 80 | ..... | ..... |
| 4,500 00 | 887 61 | 3,612 39 | ..... | ..... |
| 200,000 00 | 161,008 64 | 38,991 36 | ..... | ..... |
| 45,000 00 | 27,281 04 | 17,718 96 | ..... | ..... |
| 3,857 07 | 3,799 51 | 57 56 | ..... | ..... |
| 60 33 | ..... | 60 33 | ..... | ..... |
| 257 18 | ..... | 257 18 | ..... | ..... |
| 12,867 11 | 12,867 11 | ..... | ..... | ..... |
| 27,983 04 | 27,983 04 | ..... | ..... | ..... |
| 813 02 | ..... | 813 02 | ..... | ..... |
| ..... | $347,161 37 | | | |
| 193,161 69 | 99,994 34 | 93,167 35 | $6,600 00 | $86,567 35 |
| 146 67 | ..... | ..... | ..... | ..... |
| ..... | $447,155 71 | ..... | ..... | ..... |

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Contracts Entered Into During the Year 1908.

BOROUGHS OF MANHATTAN AND THE BRONX.

| | |
|---|---|
| Rafferty Brothers—Furnishing materials, repairing and restoring artificial stone sidewalks, etc. | $1,350 00 |
| Frank H. D'Ossone—Furnishing, repairing, placing and emptying vault pans, etc., at Mount Kisco. | 3,563 00 |
| The Manhattan Supply Company—Furnishing and delivering miscellaneous supplies for laboratory. | 2,498 37 |
| Patrick Goodman—Excavating and removing rock in hydrant trenches, etc. | 5,750 00 |
| Louis D. Gregory—Hauling and laying water mains in Maclay and St. Peters avenues, Chisholm, One Hundred and Twenty-ninth and One Hundred and Ninety-ninth streets, etc. | 4,586 00 |
| Louis D. Gregory—Furnishing, delivering and setting dock hydrants and appurtenances | 8,710 22 |
| Hemphill Engineering Company—Furnishing and delivering operating supplies for pumping stations. | 1,924 50 |
| The Fairbanks Company—Furnishing and delivering 12-inch I. S. gate valves | 3,000 00 |
| The Manhattan Supply Company—For furnishing and delivering operating supplies for pumping stations. | 1,264 77 |
| United States Cast Iron Pipe and Foundry Company—Furnishing and delivering cast iron water pipe, branch pipe and special castings. | 3,952 50 |
| John Fox & Co.—Furnishing and delivering cast iron water pipe, branch pipe and special castings. | 5,375 00 |
| Henry E. Fox—Furnishing, delivering and laying water mains in Sixty-fourth, Seventieth and Exterior streets, under the East River to Blackwells Island and on Blackwells Island. | 38,267 61 |
| Henry E. Fox—Furnishing, delivering and laying water mains in Eastern boulevard and Pelham Bay Park and subaqueous water mains across Eastchester Creek, near Pelham Bridge. | 22,938 86 |
| A. J. & J. J. McCollum—Furnishing, delivering and storing anthracite coal in the following amount: 17,000 gross tons of broken size anthracite coal | 82,220 00 |
| Thomas M. Hart—Furnishing materials, repairing and restoring artificial stone sidewalks, etc. | 1,100 00 |
| Siegel-Cooper Company—Furnishing and delivering agricultural, mechanics' and contractors' tools, paints, oils, hardware, etc. | 1,194 50 |
| J. Edward Ogden Company—Furnishing and delivering agricultural, mechanics' and contractors' tools, paints, oils, hardware, etc. | 1,296 38 |
| Cornelius Daly—Furnishing and delivering agricultural, mechanics' and contractors' tools, paints, oils, hardware, etc. | 3,288 60 |

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Henry E. Fox—Furnishing labor and materials and relaying 20 and 12-inch water mains, through Highway Bridge at Southern boulevard and One Hundred and Forty-second street, Borough of The Bronx ..... 1,100 00

James M. Rodgers—Furnishing, delivering and laying water mains in Bathgate, Bryant, Johnson, Lafayette and Popham avenues, etc., Borough of The Bronx..... 69,521 21

Louis D. Gregory—Furnishing, delivering and laying water mains in First avenue, from One Hundred and Tenth street to One Hundred and Twenty-fifth street and in One Hundred and Twenty-fifth street, between First and Third avenues..... 58,387 31

Oil City Boiler Works—Furnishing, delivering and erecting four (4) water tube boilers, with economizer, steam and auxiliary piping, etc., complete in the boiler room of One Hundred and Seventy-ninth street pumping station..... 41,900 00

The A. P. Smith Manufacturing Company—Furnishing and delivering double nozzle standard New York hydrants, repair parts for the same, etc. ..... 7,337 50

The Wilton Construction Company—Hauling and laying water mains in Briggs and Burnside avenues, Borough of The Bronx..... 3,692 91

Frank McSwegan & Son—Dismantling and removing the two (2) batteries of two (2) horizontal return tubular boilers each, and their appurtenances, from the boiler room of the Ninety-eighth Street Pumping Station and dismantling and removing two (2) Stirling water tube boilers and their appurtenances, now located in the incinerating plant at the Delancey street end of the Williamsburg Bridge, and reerecting these two (2) Stirling boilers, etc., in boiler room of the Ninety-eighth Street Pumping Station..... 10,290 00

Boettner-Chapman Company—Engineers' and Draughtsmen's supplies.... 962 00

Technical Supply Company—Engineers' and Draughtsmen's supplies.... 1,101 78

Roe Stephens Manufacturing Company—Furnishing and delivering double nozzle standard New York hydrants, repair parts for the same, etc. ..... 1,562 50

The Nassau Smelting and Refining Company—Furnishing and delivering pig lead..... 3,472 00

McHarg-Barton Company—Furnishing, delivering and constructing gate vaults for the high pressure pumping stations located at Gansevoort and West streets and at Oliver and South streets..... 3,080 00

The A. P. Smith Manufacturing Company—Furnishing, delivering and erecting a system of water curtains with all piping valves, manifolds, sprinkler heads, brackets, supports and all other appurtenances, complete in place, and ready for operation, in the high pressure

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pumping stations located at Oliver and South streets and at Gansevoort and West streets..... 7,980 00

Alfred Box & Co.—Furnishing, delivering and installing one hand operated traveling crane in the high pressure pumping station located at Gansevoort and West streets, and furnishing, delivering and installing one hand operated traveling crane in the high pressure pumping station located at Oliver and South streets..... 5,380 00

BOROUGH OF QUEENS.

A. J. & J. J. McCollum—Furnishing, delivering and storing anthracite coal in the following amount: 2,000 gross tons of anthracite coal..... $8,380 00

A. J. & J. J. McCollum—Furnishing, delivering and storing anthracite coal in the following amount: 4,000 gross tons of anthracite coal..... 16,760 00

## Water Consumption, Rainfall and Storage.

Tables 1 to 7 give the details of the water consumption in the Boroughs of Manhattan and The Bronx, and are similar to those accompanying the reports for 1906 and 1907. The gaugings made by the Aqueduct Commission and forwarded to us have been carefully plotted and revised curves to determine the flow have been made as often as deemed necessary from the data obtained.

Plate No. 1 gives diagrams of water on storage in the reservoirs of the Croton watershed, number of days' supply on hand, consumption of croton water, etc., for the years 1897 to 1908, both inclusive, also estimated population and consumption of Croton water for the years 1909 to 1916 inclusive.

TABLE 1.

Average Daily Consumption in Million Gallons.

BOROUGHS OF MANHATTAN AND THE BRONX, 1908.

| Month. | New Aqueduct. | Old Aqueduct. | Gain or Loss in Distributing Reservoirs. | Bronx and Byram. | Total, Manhattan and The Bronx. |
|---|---|---|---|---|---|
| January | 241 | 62 | +2 | 20 | 325 |
| February | 264 | 58 | —2 | 20 | 340 |
| March | 256 | 53 | .. | 20 | 329 |
| April | 250 | 54 | +1 | 20 | 325 |
| May | 253 | 54 | —5 | 20 | 322 |
| June | 267 | 54 | —1 | 20 | 340 |
| July | 265 | 55 | +1 | 20 | 341 |
| August | 254 | 54 | +1 | 20 | 329 |
| September | 257 | 55 | —1 | 20 | 331 |
| October | 247 | 54 | .. | 20 | 321 |
| November | 237 | 53 | +2 | 20 | 312 |
| December | 246 | 42 | +1 | 20 | 309 |
| Average for year | 254 | 54 | —1 | 20 | 327 |

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TABLE 2.

Average Daily Consumption of Croton Water in Million Gallons for Each Month from 1898 to 1908, Inclusive.

| Month. | 1898. | 1899. | 1900. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January..... | 204 | 218 | 248 | 254 | 262 | 274 | 280 | 294 | 302 | 319 | 305 |
| February..... | 206 | 223 | 251 | 252 | 261 | 271 | 290 | 301 | 304 | 331 | 320 |
| March..... | 202 | 226 | 233 | 251 | 256 | 267 | 279 | 299 | 298 | 324 | 309 |
| April..... | 197 | 218 | 236 | 241 | 258 | 264 | 273 | 295 | 297 | 309 | 305 |
| May..... | 195 | 218 | 239 | 238 | 255 | 265 | 276 | 293 | 297 | 304 | 302 |
| June..... | 205 | 228 | 250 | 247 | 257 | 263 | 287 | 295 | 308 | 308 | 320 |
| July..... | 209 | 224 | 254 | 264 | 258 | 272 | 289 | 303 | 310 | 313 | 321 |
| August..... | 213 | 232 | 259 | 267 | 263 | 267 | 281 | 298 | 295 | 316 | 309 |
| September..... | 223 | 227 | 260 | 265 | 270 | 271 | 287 | 298 | 311 | 302 | 210 |
| October..... | 217 | 230 | 255 | 266 | 264 | 265 | 285 | 301 | 310 | 302 | 301 |
| November..... | 210 | 230 | 251 | 260 | 268 | 264 | 282 | 302 | 306 | 294 | 292 |
| December..... | 207 | 224 | 251 | 262 | 274 | 270 | 291 | 303 | 316 | 299 | 290 |
| Average for year. | 209 | 226 | 249 | 256 | 262 | 268 | 283 | 298 | 304 | 310 | 307 |

Total consumption of Croton water for the year 1908, 112,337 million gallons.

Water wasted over Croton dam during the year 1908, 50,574 million gallons.

TABLE 3.

Estimated Population and Average Daily Supply of Water Required for the Boroughs of Manhattan and The Bronx, from 1905 to 1917, Inclusive.

| Year. | Estimated Population. | Estimated Consumption Per Capita in Gallons. | Estimated Average Daily Consumption in Gallons. |
|---|---|---|---|
| 1905..... | 2,390,000 | 133 | 319,000,000 |
| 1906..... | 2,464,000 | 135 | 333,000,000 |
| 1907..... | 2,541,000 | 137 | 348,000,000 |
| 1908..... | 2,620,000 | 139 | 364,000,000 |
| 1909..... | 2,703,000 | 141 | 381,000,000 |
| 1910..... | 2,788,000 | 143 | 398,000,000 |
| 1911..... | 2,876,000 | 145 | 417,000,000 |
| 1912..... | 2,967,000 | 147 | 436,000,000 |

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| Year. | Estimated Population. | Estimated Consumption Per Capita in Gallons. | Estimated Average Daily Consumption in Gallons. |
|---|---|---|---|
| 1913 | 3,062,000 | 149 | 456,000,000 |
| 1914 | 3,160,000 | 151 | 477,000,000 |
| 1915 | 3,262,000 | 153 | 499,000,000 |
| 1916 | 3,368,000 | 155 | 522,000,000 |
| 1917 | 3,478,000 | 157 | 546,000,000 |

The estimates of population have been based on the Federal Census of 1900 and the State Census of 1905, as well as the records and estimates of the Health Department figured to July 1 of each year.

The increase in consumption has been estimated to be proportioned to that on population with a yearly addition of two gallons per day to the per capita consumption.

TABLE 4.

Rainfall, Croton Watershed, 1908.

| Month. | Boyds Corner. | Carmel. | Middle Branch. | East Branch. | Amawalk. | Titicus Reservoir. | Croton Lake. | Average. |
|---|---|---|---|---|---|---|---|---|
| January | 3.97 | 3.50 | 4.21 | 3.82 | 4.18 | 4.93 | 4.95 | 4.22 |
| February | 6.27 | 5.16 | 5.63 | 5.42 | 6.39 | 7.01 | 6.45 | 6.05 |
| March | 3.53 | 3.24 | 4.08 | 3.52 | 3.90 | 4.37 | 4.23 | 3.84 |
| April | 3.23 | 2.91 | 3.30 | 3.12 | 3.26 | 4.11 | 3.45 | 3.34 |
| May | 6.20 | 5.73 | 6.13 | 6.25 | 7.26 | 7.58 | 7.60 | 6.68 |
| June | 2.22 | 2.25 | 2.26 | 1.85 | 2.46 | 1.98 | 2.74 | 2.25 |
| July | 2.50 | 2.56 | 3.03 | 2.19 | 2.23 | 2.25 | 2.92 | 2.53 |
| August | 4.59 | 6.32 | 6.12 | 5.18 | 7.80 | 7.25 | 8.68 | 6.56 |
| September | 1.04 | 0.84 | 0.83 | 1.46 | 1.04 | 1.23 | 1.15 | 1.09 |
| October | 2.09 | 1.76 | 1.92 | 1.83 | 2.00 | 1.90 | 2.16 | 1.95 |
| November | 0.90 | 1.08 | 1.09 | 1.04 | 1.12 | 1.17 | 0.75 | 1.02 |
| December | 3.57 | 3.72 | 3.32 | 3.12 | 3.42 | 3.63 | 3.68 | 3.49 |
| Total for year.. | 40.11 | 39.07 | 41.92 | 38.80 | 45.06 | 47.41 | 48.76 | 43.02 |
| Total, 1907 | 56.44 | 58.32 | 60.11 | 56.61 | 57.77 | 65.33 | 61.74 | 59.47 |

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## Rainfall, Kensico Watershed, 1908.

| | | | |
|---|---|---|---|
| January | 4.36 | July | 6.95 |
| February | 7.43 | August | 8.78 |
| March | 3.97 | September | 1.48 |
| April | 3.40 | October | 2.53 |
| May | 7.98 | November | 0.95 |
| June | 1.48 | December | 3.97 |
| Total for the year | | | 53.28 |
| Total for 1907 | | | 58.33 |

## TABLE 5.

### Storage on the Croton Watershed in Million Gallons.

| Name of Reservoir. | Flashboards, Inches. | Total Contents When Full to Crest of Flashboards on Spillway. | September 30, 1908. Distance Below Spillway in Feet. | September 30, 1908. Storage on Hand in Million Gallons. | December 31, 1908. Distance Below Spillway in Feet. | December 31, 1908. Storage on Hand in Million Gallons. | Storage Drawn During Quarter Ending December 31, 1908. | Additional Water Stored During Quarter Ending December 31, 1908. |
|---|---|---|---|---|---|---|---|---|
| Boyds Corner | .. | 2,727 | 0.17 | 2,711 | 42.00 | 190 | 2,521 | .... |
| West Branch | 29 | 10,669 | 17.25 | 4,570 | 33.46 | 1,049 | 3,521 | .... |
| Middle Branch | 12 | 4,155 | 5.33 | 3,287 | 10.71 | 2,625 | 662 | .... |
| East Branch | .. | 5,243 | 17.58 | 2,569 | 38.83 | 774 | 1,795 | .... |
| Bog Brook | .. | 4,400 | 17.67 | 2,303 | 33.67 | 768 | 1,535 | .... |
| Titicus | 24 | 7,617 | 20.62 | 3,392 | 28.62 | 2,351 | 1,041 | .... |
| Amawalk | 24 | 7,086 | 13.58 | 4,410 | 36.50 | 1,702 | 2,708 | .... |
| Cross River | .. | 10,308 | *.... | 10,308 | 17.98 | 5,660 | 4,648 | .... |
| Muscoot | 24 | 5,705 | *.... | 4,914 | *.... | 4,914 | .... | .... |
| New Croton | 24 | 28,110 | 9.68 | 20,060 | 13.91 | 17,394 | 2,666 | .... |
| Mahopac | .. | 575 | 0.55 | 512 | 1.57 | 395 | 117 | .... |
| Kirk | .. | 565 | 3.75 | 445 | 7.46 | 327 | 118 | .... |
| Gleneida | .. | 165 | 0.56 | 147 | 1.83 | 105 | 42 | .... |
| Gilead | .. | 380 | 1.21 | 350 | 1.75 | 338 | 12 | .... |
| Barretts Pond | .. | 170 | 0.19 | 167 | 4.67 | 91 | 76 | .... |
| White Pond | .. | 200 | 0.87 | 175 | 1.58 | 154 | 21 | .... |
| Total | | 88,075 | | 60,320 | | 38,837 | 21,483 | .... |
| Net amount of storage lost during quarter | | | | | | .... | 21,483 | |
| Corresponding amount on hand December 31, 1907 | | | | | | 75,749 | | |

* Full.

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Storage on Bronx and Byram Watershed in Million Gallons.

| Name of Reservoir. | Flashboards, Inches. | Total Contents When Full to Crest of Flashboards on Spillway. | September 30, 1908. Distance Below Spillway in Feet. | September 30, 1908. Storage on Hand in Million Gallons. | December 31, 1908. Distance Below Spillway in Feet. | December 31, 1908. Storage on Hand in Million Gallons. | Storage Drawn During Quarter Ending December 31, 1908. | Additional Water Stored During Quarter Ending December 31, 1908. |
|---|---|---|---|---|---|---|---|---|
| Kensico | 24 | 1,797 | 4.92 | 1,254 | 5.00 | 1,248 | 6 | .... |
| Byram | 12 | 898 | 3.85 | 647 | 7.92 | 435 | 212 | .... |
| Rye | 12 | 1,440 | 2.42 | 1,090 | 8.08 | 590 | 500 | .... |
| Wampus | .. | 60 | .... | 60 | .... | 60 | .... | .... |
| Total | | 4,190 | | 3,051 | | 2,333 | 718 | .... |
| Net amount of storage lost during the quarter | | | | | | .... | 718 | |
| Corresponding amount on hand December 31, 1907 | | | | | | 4,160 | | |

During the first six months of the year ending December 31, 1908, 50,574 million gallons of water went to waste over the New Croton Dam with all reservoirs full.

During the first six months of the year ending December 31, 1908, 2,650 million gallons wasted over the Kensico Dam.

Cross River Reservoir—An equipment for 24-inch flashboards on this reservoir has been provided, but not having been in service, the 615 million gallons held back by them has not been included in the table of total contents, Croton Watershed.

TABLE 6.

Average Daily Flow of the Croton River in Million Gallons.

| Month. | 1900. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|---|---|---|---|---|---|---|---|---|---|
| January | 337 | 232 | 719 | 690 | 435 | 812 | 466 | 514 | 748 |
| February | 1,334 | 101 | 550 | 718 | 571 | *245 | 367 | 223 | 885 |
| March | 1,034 | 979 | 1,872 | 1,148 | 1,032 | *821 | 831 | 806 | 895 |
| April | 378 | 1,484 | 640 | 663 | 622 | *680 | 922 | 600 | 441 |
| May | 457 | 811 | 342 | 118 | 307 | *172 | 317 | 472 | 547 |
| June | 138 | 315 | 161 | 642 | 224 | 224 | 286 | 404 | 251 |
| July | 87 | 270 | 140 | 298 | 158 | 68 | 213 | 90 | 44 |

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| Month. | 1900. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|---|---|---|---|---|---|---|---|---|---|
| August | 22 | 732 | 109 | 289 | 229 | 95 | 180 | 20 | 109 |
| September | 60 | 422 | 136 | 355 | 496 | 258 | 72 | 301 | 20 |
| October | 105 | 509 | 432 | 929 | 299 | 138 | 189 | 766 | 26 |
| November | 259 | 243 | 279 | 335 | 267 | 115 | 159 | 1,046 | 35 |
| December | 363 | 872 | 940 | 510 | 206 | 375 | 218 | 815 | 107 |
| Average for year | 375 | 584 | 529 | 557 | 403 | 334 | 351 | 506 | 341 |

* Calculated from observed flow at New Croton Dam.

1900 to 1905, inclusive, computed from flow at the Old Croton Dam, with a drainage area of 338.8 square miles.

1905 to date, computed from flow at New Croton Dam with a drainage area of 360.4 square miles.

TABLE 7.

Rainfall and Run-off on Croton Watershed.

| | 1900. | | 1901. | | 1902. | |
|---|---|---|---|---|---|---|
| | Rainfall. | Run-off. | Rainfall. | Run-off. | Rainfall. | Run-off. |
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| January | 3.76 | 1.78 | 1.63 | 1.22 | 2.91 | 3.79 |
| February | 7.66 | 6.35 | 0.84 | 0.48 | 4.04 | 2.61 |
| March | 4.77 | 5.44 | 7.18 | 5.15 | 6.42 | 9.85 |
| April | 2.03 | 1.93 | 8.19 | 7.56 | 4.42 | 3.26 |
| May | 5.87 | 2.40 | 7.01 | 4.27 | 3.57 | 1.80 |
| June | 2.44 | 0.70 | 1.48 | 1.60 | 4.69 | 0.82 |
| July | 3.87 | 0.46 | 8.35 | 1.42 | 4.29 | 0.74 |
| August | 2.38 | 0.12 | 9.03 | 3.85 | 2.52 | 0.58 |
| September | 3.36 | 0.30 | 5.49 | 2.15 | 6.34 | 0.69 |
| October | 4.17 | 0.55 | 3.94 | 2.68 | 6.23 | 2.27 |
| November | 5.36 | 1.32 | 1.80 | 1.24 | 0.90 | 1.42 |
| December | 2.52 | 1.91 | 8.81 | 4.59 | 7.15 | 4.95 |
| Total | 48.19 | 23.26 | 63.75 | 36.21 | 53.48 | 32.78 |
| Per cent | | 48 | | 57 | | 61 |

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| | 1903. | | 1904. | | 1905. | |
|---|---|---|---|---|---|---|
| | Rainfall. | Run-off. | Rainfall. | Run-off. | Rainfall. | Run-off. |
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| January | 4.34 | 3.63 | 4.01 | 2.29 | 6.79 | 4.28 |
| February | 4.88 | 3.41 | 3.26 | 2.81 | 1.70 | 1.17 |
| March | 5.56 | 6.05 | 3.68 | 5.43 | 4.22 | 4.33 |
| April | 2.97 | 3.38 | 4.35 | 3.17 | 3.16 | 3.46 |
| May | 1.05 | 0.62 | 4.10 | 1.62 | 1.10 | 0.91 |
| June | 11.26 | 3.27 | 2.37 | 1.14 | 6.37 | 1.14 |
| July | 2.90 | 1.57 | 5.51 | 0.83 | 3.23 | 0.36 |
| August | 7.74 | 1.52 | 7.02 | 1.21 | 6.07 | 0.50 |
| September | 3.03 | 1.81 | 7.01 | 2.53 | 4.66 | 1.32 |
| October | 7.86 | 4.89 | 3.75 | 1.57 | 3.33 | 0.73 |
| November | 2.76 | 1.71 | 2.19 | 1.36 | 2.36 | 0.59 |
| December | 4.48 | 2.68 | 3.45 | 1.09 | 3.68 | 1.98 |
| Total | 58.83 | 34.54 | 50.70 | 25.05 | 46.67 | 20.76 |
| Per cent | | 59 | | 49 | | 44 |

| | 1906. | | 1907. | | 1908. | |
|---|---|---|---|---|---|---|
| | Rainfall. | Run-off. | Rainfall. | Run-off. | Rainfall. | Run-off. |
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| January | 2.53 | 2.30 | 4.19 | 2.54 | 4.22 | 3.70 |
| February | 2.78 | 1.65 | 2.98 | 1.03 | 6.05 | 4.10 |
| March | 6.33 | 4.11 | 2.61 | 3.99 | 3.84 | 4.43 |
| April | 4.87 | 4.41 | 3.79 | 2.87 | 3.34 | 2.11 |
| May | 4.17 | 1.57 | 5.19 | 2.33 | 6.68 | 2.71 |
| June | 4.30 | 1.37 | 4.77 | 1.93 | 2.25 | 1.20 |
| July | 6.03 | 1.05 | 2.28 | 0.44 | 2.53 | 0.21 |
| August | 3.49 | 0.89 | 2.31 | 0.10 | 6.56 | 0.54 |
| September | 3.29 | 0.34 | 10.99 | 1.44 | 1.09 | 0.10 |
| October | 4.81 | 0.93 | 8.73 | 3.79 | 1.95 | 0.13 |
| November | 1.53 | 0.76 | 6.25 | 5.00 | 1.02 | 0.17 |
| December | 4.10 | 1.08 | 5.38 | 4.03 | 3.46 | 0.53 |
| Total | 48.23 | 20.45 | 59.47 | 29.49 | 43.02 | 19.94 |
| Per cent | | 43 | | 50 | | 46 |

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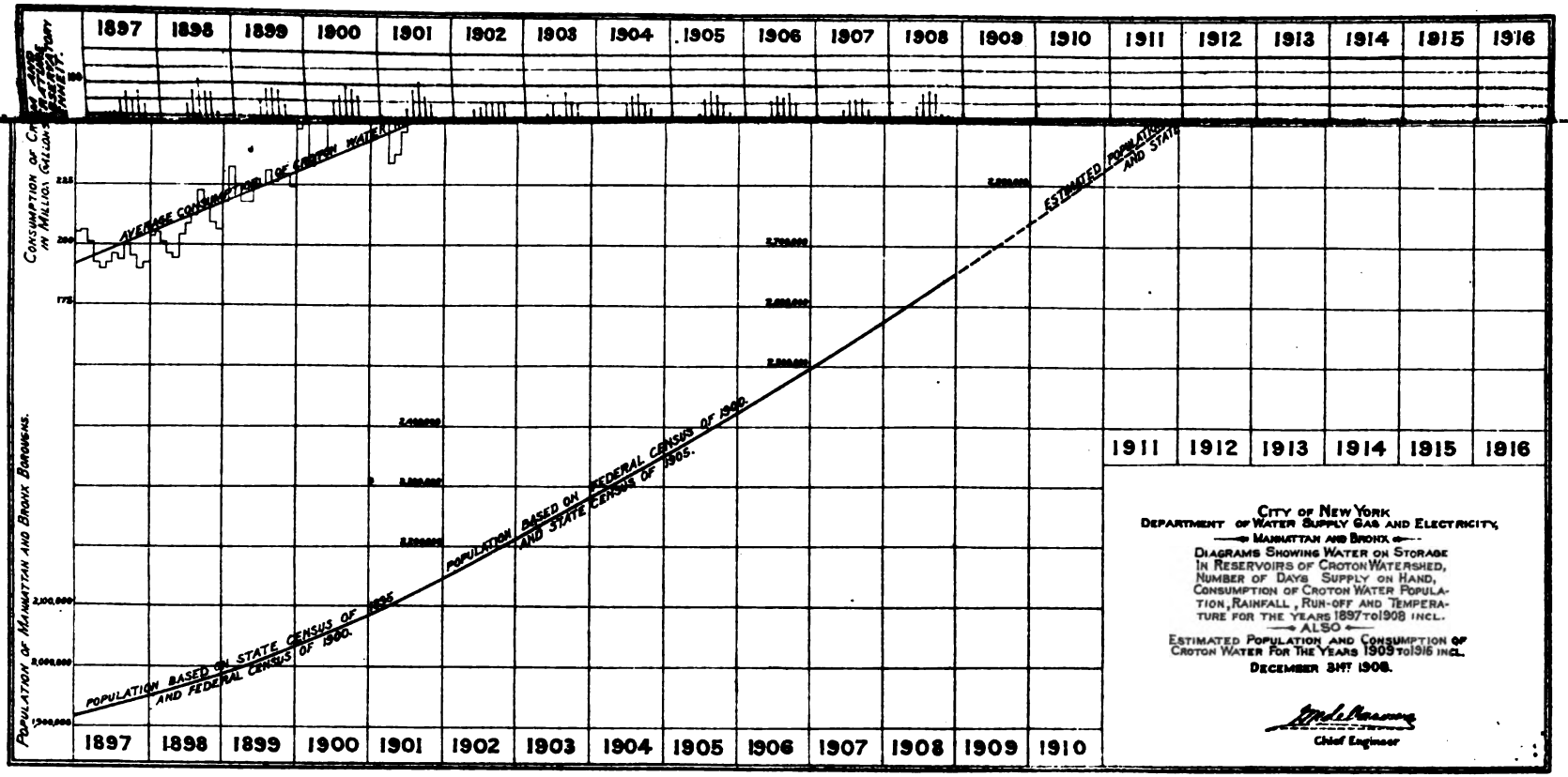


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## Prevention of Water Waste.

In the annual reports for both 1905 and 1906, attention was called to the necessity of adopting measures to prevent waste, and full plan outlined detailing methods to be followed for that purpose, and which comprised measurement of flow through mains, examinations to determine the illegal use of water, if any, house to house inspection and installation of meters, and in the annual report for last year the matter was again discussed and reference made to the communication forwarded by you to the Board of Estimate, endorsing the recommendations of this Bureau and recommending the adoption of a resolution authorizing the necessary appropriations to carry out the provisions of the act, known as chapter 611 of the Laws of 1906, in regard to the installation of meters by the Commissioner, under the conditions therein stated. The aggregate amount required to cover the installation of meters, instruments and appurtenances, salary account for Assistants, Inspectors, etc., etc., both for the Boroughs of Manhattan and The Bronx and for Brooklyn, was $108,825.

It is to be regretted that no action has yet been taken in this matter. We have every reason to believe that the results obtained from this work, as has been shown in Brooklyn at various times, would fully warrant the expenditure and, furthermore, the measures to check waste as much as possible become more and more urgent with the increase in consumption in the Boroughs of Manhattan and The Bronx without corresponding increase in the supply. For the last two or three years we have been favored with abundant rainfall, advantageously distributed, but it is not to be expected that these favorable conditions shall continue, and even one or two years of drouth would bring us perilously near to a shortage in supply.

## Croton Watershed.

### Maintenance and Repairs, Quarter Ending December 31, 1908.

### Division No. 1.

The work on this division has been: Clearing shore line of Croton Lake of brush, weeds, grass, etc.; cleaning screens and roof of gate house; patrolling reservoir and streams; collecting water samples.

### Division No. 2.

The work on this division has been: Building, repairing and painting fences; cutting and burning grass, leaves, etc., along old aqueduct; regrading around shaft sites; building drains; putting new sills under store house; cleaning walks and gutters; cleaning meter vault; erecting telephone poles; patrolling aqueduct lines.

### Division No. 3.

The work on this division has been: Building, repairing and painting fences along old aqueduct and at shaft sites of new aqueduct; rebuilding culverts, gutters, etc.

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Division No. 4.

The work on this division has been: Building, repairing and painting fences; building retaining wall; hauling earth and stone; cleaning crosswalk, culverts, drains, etc.; cutting grass and weeds on aqueduct property.

Division No. 5.

The work on this division has been: Hauling stone; excavating earth and building retaining wall; setting new telephone poles; cleaning snow and ice from sidewalks, etc.

Division No. 6.

The work on this division has been: Building, repairing and painting fences; cleaning culverts, gutters and crosswalks; resurfacing roadway on old aqueduct; repairing roof of Keeper's house; setting telephone poles; painting head house, etc.

Division No. 7.

The work on this division has been: Building, repairing and painting fences; relaying flagging; repairing stone work on tower and steps; repointing brickwork inside High Bridge; hoisting and trimming coal; cleaning walks, etc., of snow; cleaning interior of High Bridge.

Division No. 8.

The work on this division has been: Patrolling Central Park Reservoir and pipe lines; repairing and painting fences and painting north gate house; cleaning screens; keeping surface of water clean; cutting grass; cleaning snow from walks.

Boyds Corner Reservoir.

The work at this reservoir has been: Cutting grass, weeds, etc., on dam embankments and vicinity; patrolling reservoir and streams; collecting water samples for laboratory.

Middle Branch Reservoir.

The work at this reservoir has been: Cutting grass, weeds, etc.; resurfacing highways on north and east sides; repairing fences; placing rip-rap, etc.; patrolling reservoir and streams; collecting water samples for the laboratory.

White Pond Reservoir.

The work at this reservoir has been: Patrolling pond and streams; collecting water samples.

Electrozone Plant.

The electrozone plant has been in continuous operation during the quarter.

East Branch and Bog Brook Reservoirs.

The work at these reservoirs has been; Building, repairing and painting fences; cleaning gate houses; oiling stopcocks; cleaning and painting gates and screws; patrolling reservoirs and streams and collecting water samples.

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### Titicus Reservoir.

The work at this reservoir has been: Repairing post and rail fences; placing rip-rap; cleaning and painting gate stands, beams and floor plates in gate house; cutting brush, weeds, etc., along the reservoir; patrolling reservoir and streams and collecting water samples.

### Muscoot Reservoir.

The work on this division has been: Building, repairing and painting fences; cleaning stopcocks, screws, etc., in gate house; patrolling reservoir and streams, and collecting water samples.

## Bronx River Division.

### Williamsbridge Section.

The work on this section has been: Building fences; cleaning gutters, blowoff channel and reservoir slopes; hauling crushed stone and resurfacing roadway.

### Kensico Section.

The work on this section has been: Building and repairing fences and bridges; patrolling reservoir and streams; collecting water samples; cutting and burning grass, weeds, etc., along reservoir and streams.

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SUMMARY OF

Croton Watersheds, Aqueducts and Bronx

| | Division Aqueduct No. 1. | Division Aqueduct No. 2. | Division Aqueduct No. 3. | Division Aqueduct No. 4. | Division Aqueduct No. 5. | Division Aqueduct No. 6. | Division Aqueduct No. 7. |
|---|---|---|---|---|---|---|---|
| Earth excavated, cubic yards..... | .... | 104 | .... | 70 | 225 | .... | .... |
| Dry stone masonry, cubic yards..... | .... | 15 | .... | 91 | 32 | 3 | .... |
| Masonry pointed, square yards..... | .... | .... | .... | .... | .... | .... | 324 |
| Stone fence wall built, cubic yards.... | .... | .... | .... | .... | 18 | .... | .... |
| Stone fence wall repaired, cubic yards. | .... | .... | .... | .... | 33 | 60 | .... |
| Rip-rap placed, cubic yards..... | .... | .... | .... | .... | .... | .... | .... |
| Paving repaired, square yards..... | .... | .... | .... | .... | .... | .... | .... |
| Filling and grading, cubic yards..... | .... | .... | .... | .... | .... | 17 | .... |
| Crushed stone, etc., placed, cubic yards | .... | .... | .... | .... | .... | .... | .... |
| Gutters repaired, square feet..... | .... | 50 | .... | .... | 1,372 | 125 | .... |
| Flagging relaid, square feet..... | .... | 504 | .... | .... | .... | 90 | 2,436 |
| Brickwork pointed, square feet..... | .... | .... | .... | .... | .... | .... | 782 |
| Stone hauled, cubic yards..... | .... | .... | 30 | .... | 73 | 200 | .... |
| Earth hauled, cubic yards..... | .... | 39 | .... | 55 | 20 | 50 | .... |
| Sodding laid, square yards..... | .... | 120 | .... | .... | 97 | .... | .... |
| Fence built, linear feet..... | .... | 3,490 | .... | 1,975 | 1,050 | 710 | .... |
| Fence repaired, linear feet..... | .... | 759 | 3,963 | 5,500 | 495 | 9,500 | 2,961 |
| Fence painted, linear feet..... | .... | 3,142 | 16,702 | 2,150 | 1,382 | 8,751 | 4,868 |
| Fence gates built or repaired..... | .... | 7 | .... | .... | 1 | .... | .... |
| Fence gates painted..... | .... | .... | .... | .... | .... | 20 | .... |
| Telephone poles removed and set..... | .... | 31 | 14 | .... | 64 | .... | .... |
| Telephone poles hauled and trimmed.. | .... | 403 | .... | .... | 18 | .... | .... |
| Old fence removed, linear feet..... | .... | .... | .... | .... | .... | .... | .... |
| Culverts cleaned or repaired..... | .... | .... | 8 | .... | 17 | 10 | .... |
| Fence posts set..... | .... | 60 | 175 | .... | 125 | 105 | .... |
| Fence posts cut and trimmed..... | .... | .... | .... | .... | .... | .... | .... |
| Gravel hauled, cubic yards..... | .... | .... | .... | .... | .... | .... | .... |
| Telephone poles painted..... | .... | .... | .... | .... | .... | 29 | .... |
| Drains cleaned, linear feet..... | .... | .... | .... | .... | .... | 450 | .... |
| Fence posts peeled..... | .... | 205 | .... | .... | .... | .... | .... |
| Brick sidewalk built, square feet..... | .... | 472 | .... | .... | .... | .... | .... |
| Sidewalks repaired, square yards..... | .... | .... | .... | .... | .... | .... | .... |
| Roadway repaired, square yards..... | .... | .... | .... | .... | .... | .... | .... |
| Picket fence built, linear feet..... | .... | .... | .... | 300 | .... | 400 | .... |
| Picket fence painted, linear feet..... | .... | 1,000 | 60 | .... | .... | .... | 485 |
| Curbing reset, linear feet..... | .... | .... | .... | .... | .... | .... | 250 |

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WORK DONE.

River Works, Maintenance and Repairs.

| Aqueduct Division No. 8. | Boyds Corner Reservoir. | Middle Branch Reservoir. | East Branch Reservoir. | Bog Brook Reservoir. | West Branch Reservoir. | White Pond Reservoir. | Titicus Reservoir. | Muscoot Reservoir. | Bronx River Works. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|
| .... | .... | 40 | .... | .... | .... | .... | .... | .... | 705 | 1,144 |
| .... | .... | 200 | .... | .... | 147 | .... | 48 | 178 | 5 | 719 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 6,344 | 6,668 |
| .... | .... | .... | .... | .... | 77 | .... | .... | .... | 35 | 130 |
| .... | .... | 219 | .... | .... | .... | .... | .... | 105 | .... | 417 |
| .... | .... | 32 | .... | .... | 153 | .... | 479 | 144 | 103 | 911 |
| .... | .... | .... | .... | .... | 1,368 | .... | .... | .... | .... | 1,368 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 17 |
| .... | .... | 400 | .... | .... | .... | .... | .... | .... | .... | 400 |
| .... | .... | .... | .... | .... | 1,500 | .... | .... | .... | 105 | 3,152 |
| .... | .... | .... | .... | .... | 335 | .... | .... | .... | .... | 3,365 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 782 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 595 | 898 |
| 50 | .... | 346 | .... | .... | 22 | .... | .... | .... | 584 | 1,166 |
| .... | ... | .... | .... | .... | .... | .... | .... | .... | 3,870 | 4,087 |
| 300 | .... | 310 | 800 | .... | .... | .... | 570 | 1,667 | 20,361 | 31,233 |
| .... | .... | .... | 1,200 | .... | 3,756 | .... | 876 | 4,000 | 3,610 | 36,361 |
| 3,153 | .... | .... | .... | .... | 5,028 | .... | 2,850 | .... | 13,800 | 64,726 |
| .... | .... | .... | .... | .... | 3 | .... | 2 | .... | .... | 13 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 20 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 109 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 421 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 1,000 | 1,000 |
| .... | .... | .... | .... | .... | .... | .... | 3 | 3 | .... | 41 |
| .... | .... | .... | .... | .... | 796 | .... | .... | .... | 900 | 2,161 |
| .... | .... | .... | .... | .... | 648 | .... | .... | .... | .... | 648 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 127 | 127 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 29 |
| .... | .... | 200 | .... | .... | .... | .... | .... | .... | .... | 650 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 205 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 472 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 3,000 | 3,000 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 17,060 | 17,060 |
| 850 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1,550 |
| 4,510 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 6,055 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 250 |

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### Sanitary Patrol and Inspection of Watershed.

There have been but two cases of typhoid fever in the watershed during the last quarter and a total of but ten for the year.

Eighty-nine notices "to abate nuisances" were issued, forty-one of which were not complied with. These numbers do not include the numerous examinations and reports submitted, as for example the many cases in the village of Mount Kisco.

The list of dead animals found and properly disposed of is as follows:

| | | | |
|---|---|---|---|
| Horses | 19 | Turtles | 17 |
| Cows | 9 | Chickens | 10 |
| Dogs | 32 | Ducks | 1 |
| Pups | 11 | Pigs | 1 |
| Calves | 10 | Rabbits | 1 |
| Woodchucks | 43 | Mink | 1 |
| Raccoons | 1 | Fox | 1 |
| Otters | 2 | Skunks | 4 |
| Cats | 35 | Sheep | 2 |
| Muskrats | 29 | | |
| Snakes | 34 | Total | 263 |

Thousands of dead fish were removed from the shores of the reservoirs and streams.

The efficiency of the Sanitary Patrol would be greatly increased if compensation for a horse and wagon be given the Inspector in charge of the Patrolmen.

## Analytical and Biological Work Performed During the Year Ending December 31, 1908.

### Collection of Samples.

The schedule for the collection of samples of water for analysis has been practically as follows:

Daily samples have been collected from the terminus of the Croton Aqueduct at the One Hundred and Thirty-fifth street gate-house and at a tap in City Hall square for physical and bacteriological analysis. Once a week complete sanitary analyses have been made on these samples as well as upon samples collected from the outlets of the distribution reservoirs in Central Park, at High Bridge, at Jerome Park and at Williamsbridge. The samples collected at One Hundred and Thirty-fifth street gate-house and at High Bridge, Jerome Park and Williamsbridge Reservoirs were examined bacteriologically at Jerome Park Experiment Station during the early part of the year. During the latter part of the year this work was transferred to Mount Prospect Laboratory. The chemical analyses from these stations and the complete

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analyses from City Hall tap and the Central Park Reservoirs were also analyzed at Mount Prospect Laboratory.

Weekly samples have been collected from all the storage reservoirs on the Croton watershed, from a number of points on the Croton River and its tributaries, and from the reservoirs of The Bronx and Byram systems. These samples have been sent to the branch laboratory at Mount Kisco and examined bacteriologically and physically, and on alternate weeks microscopically. Once a month complete sanitary analyses have been made upon samples from these sources. Complete analyses have also been made upon weekly samples from the Croton Lake intakes and from various other points on the lake.

Samples have been collected from the ground water supplies in the Borough of Queens as often as once a month or once a quarter (as occasion seemed to require) and given a complete sanitary analysis at Mount Prospect Laboratory.

Daily samples have been collected and analyzed for chlorine from North Beach Pumping Station and Long Island City Station No. 2.

## Analytical Work on Water.

The following figures give the amount of work which has been done at Mount Prospect, Jerome Park and Mount Kisco Laboratories during the year 1908:

### Total Samples of Water Analyzed by Laboratories.

| | |
|---|---|
| Mount Prospect Laboratory | 1,781 |
| Mount Kisco Laboratory | 4,173 |
| Jerome Park Laboratory | 1,142 |
| Total | 7,096 |

### Total Samples of Water Analyzed by Boroughs.

| | |
|---|---|
| Manhattan | 5,900 |
| The Bronx | 518 |
| Queens | 678 |
| Total | 7,096 |

| | |
|---|---|
| Physical examinations | 4,168 |
| Complete chemical analyses | 881 |
| Partial chemical analyses | 1,553 |
| Microscopical examinations | 2,461 |
| Bacteriological examinations | 6,259 |
| Bacteriological tests for bacillus coli | 5,430 |
| Bacteriological tests for bacillus typhosus | 10 |

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## General Analytical Work.

The following table gives an idea of the general analytical work carried on during the year at Mount Prospect Laboratory:

| | |
|---|---|
| Coal samples analyzed | 53 |
| Oil samples analyzed | 48 |
| Metals and alloys analyzed | 3 |
| Steam packing analyzed | 3 |
| Rubber analyzed | 1 |
| Boiler scale analyzed | 1 |
| Boiler compound analyzed | 1 |
| Rock analyzed | 1 |
| Special tests and experiments | 961 |

The laboratory at the Jerome Park Experiment Station, Kingsbridge road, The Bronx, established in 1907 for the purpose of determining the best method of treatment of the water from the Croton watershed, was dismantled in June, 1908.

The tables given below indicate some of the work done in connection with special features of this problem for the five months of the year 1907 that the station was in operation:

### Special Examinations Made at Jerome Park Experiment Station.

| In Connection with— | |
|---|---|
| Waters from washing machine | 112 |
| Reduction of color by alum | 28 |
| Reduction of color by miscellaneous clays | 13 |
| Reduction of color by bone black | 9 |
| Filtration through sands of various effective sizes | 14 |
| Penetration of foreign material into sand | 63 |
| Mechanical analyses of sand | 52 |

## Reports.

During the year 1908, 174 special reports have been made on the quality of the numerous sources of supply, and on oil, coal and the various constructional materials used in the Department for the Boroughs of Manhattan, The Bronx and Queens.

From the Mount Kisco Laboratory weekly reports have been made on the quality of the water on the watersheds of the supplies for Manhattan and The Bronx and upon the efficiency of the sewage disposal plant at the Montefiore Home, Bedford, N. Y. From the Mount Prospect Laboratory weekly reports upon the condition of the water in the distribution system of these boroughs were made. Weekly reports have been made upon the amount of chlorine in the water from the North Beach and Long Island City pumping stations in the Borough of Queens, and the analyses of the various sources of supply for this Borough were reported monthly.

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Studies have been made in relation to the determination of the presence of B. coli in water; in relation to the sources of typhoid fever other than water; on the isolation of bacillus typhosus from water; on the methods of analysis of sewage and on the various methods for the purification of drinking water.

## Quality of the Water.

The following table gives a comparison of the average quality of the high service and low service waters supplied to the Borough of Manhattan for the years 1907 and 1908:

| | 135th Street Gate-house. | | Tap in City Hall Square. | |
|---|---|---|---|---|
| | 1907. | 1908. | 1907. | 1908. |
| **Physical Examination.** | | | | |
| Turbidity | 4 | 3 | 3 | 2 |
| Color | 21 | 17 | 20 | 16 |
| Per cent. of samples with distinct vegetable odors | 1.1 | 0.8 | 0.3 | ..... |
| Per cent. of samples with odors of decompcsition | 2.0 | 4.7 | 1.1 | 2.7 |
| Per cent. of samp'es with odors due to organisms | 4.0 | 2.5 | 2.3 | ..... |
| **Chemical Examination.** | | | | |
| Albuminoid ammonia | 0.149 | 0.118 | 0.132 | 0.096 |
| Free ammonia | 0.056 | 0.031 | 0.022 | 0.010 |
| Nitrites | 0.005 | 0.005 | 0.004 | 0.003 |
| Nitrates | 0.20 | 0.15 | 0.21 | 0.18 |
| Total solids | 76 | 66 | ..... | ..... |
| Chlorine | 2.1 | 2.0 | ..... | ..... |
| Hardness | 38 | 33 | ..... | ..... |
| Alkalinity | 36 | 29 | ..... | ..... |
| Iron | 0.25 | 0.22 | ..... | ..... |
| **Microscopical Examination.** | | | | |
| Microscopic organisms | 1,244 | 897 | 870 | 424 |
| Amorphous matter | 636 | 486 | 574 | 308 |
| **Bacteriological Examination.** | | | | |
| Bacteria per cc | 572 | 414 | 304 | 213 |
| Per Cent. of Positive Tests for B. Coli— | | | | |
| In 0.1 cc | 0.9 | 0.8 | 0.6 | ..... |
| In 1.0 cc | 8.1 | 4.4 | 1.7 | 0.8 |
| In 10.0 cc | 52.0 | 36.3 | 30.3 | 16.1 |

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The preceding table shows the average sanitary condition of the water during the year 1908, as compared with the previous year. The figures show that there has been a marked improvement during the past year in turbidity, color and odor. The chemical examination also shows a decided improvement, as is represented by the figures for albuminoid and free ammonia, total solids, hardness and alkalinity.

The microscopic organisms in the water have greatly diminished in numbers during the year, and the bacteriological examination shows fewer bacteria in both the high service and low service systems and a great reduction in the presence of B. coli.

Accompanying this report will be found a diagram (Plate No. 2) of the daily analyses of the water from the One Hundred and Thirty-fifth street gate house, as compared with the rainfall and cases of typhoid fever reported weekly. The diagram (like the tables) shows a great improvement in the general quality of the water over the preceding year. It also shows the normal typhoid chart which is obtained in cities where the typhoid fever does not come from the water supply.

The chart for the previous year showed a spring rise in typhoid fever which was attributed to contaminated water. As pointed out in last year's report, the year 1907 is the only year in which such a rise has occurred. This small epidemic, although mild in its action, forebodes the possibility of more serious trouble from this source, and it is again strongly recommended that steps be taken to once more agitate the question of the filtration of the Croton supply.

The following table shows the great increase in microscopic organisms in Croton Lake during the last five years. The figures beginning September, 1906, are lower than those for the preceding months on account of treatment with copper sulphate of the lower portion of Croton Lake.

These samples were taken at the surface of the old dam.

Monthly Averages of Microscopic Organisms in Croton Lake.

| Month. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|---|---|---|---|---|---|---|
| January | .... | 251 | 137 | 135 | 191 | 160 |
| February | 248 | 145 | 155 | 368 | 135 | 180 |
| March | 279 | 135 | 93 | 170 | 87 | 195 |
| April | 967 | 690 | 485 | 464 | 230 | 370 |
| May | 812 | 1,310 | 1,034 | 824 | 625 | 630 |
| June | 447 | 1,197 | 1,150 | 658 | 975 | 1,345 |
| July | 1,447 | 877 | 1,324 | 1,867 | 1,550 | 1,410 |
| August | 447 | 1,250 | 1,082 | 3,303 | 5,430 | 3,445 |
| September | 496 | 785 | 1,810 | 811 | 2,725 | 5,640 |
| October | 1,165 | 1,195 | 1,635 | 704 | 1,815 | 850 |
| November | 591 | 247 | 1,369 | 940 | 345 | 615 |
| December | 284 | 305 | 681 | 539 | 225 | 900 |

BOROUGH OF THE BRONX.

The following table gives the comparative average analyses of the Williamsbridge Reservoir for the years 1907 and 1908:

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Williamsbridge Reservoir.

| | Influx. | | Efflux. | |
|---|---|---|---|---|
| | 1907. | 1908. | 1907. | 1908. |
| **Physical Examination.** | | | | |
| Turbidity | 5 | 4 | 4 | 4 |
| Color | 18 | 15 | 17 | 16 |
| Per cent. of samples with distinct vegetable odors | 3.8 | 1.9 | 3.8 | 1.9 |
| Per cent. of samples with odors of decomposition | 1.9 | 15.4 | 1.9 | 13.5 |
| Per cent. of samples with odors due to organisms | ..... | 9.6 | ..... | 9.6 |
| **Chemical Examination.** | | | | |
| Albuminoid ammonia | 0.136 | 0.125 | 0.126 | 0.118 |
| Free ammonia | 0.034 | 0.035 | 0.028 | 0.033 |
| Nitrites | 0.003 | 0.003 | 0.003 | 0.003 |
| Nitrates | 0.15 | 0.08 | 0.15 | 0.09 |
| Total solids | 69 | 66 | ..... | ..... |
| Chlorine | 2.7 | 2.6 | ..... | ..... |
| Hardness | 32 | 29 | ..... | ..... |
| Alkalinity | 27 | 23 | ..... | ..... |
| Iron | 0.21 | 0.18 | ..... | ..... |
| **Microscopical Examination.** | | | | |
| Microscopic organisms | 723 | 527 | 658 | 519 |
| Amorphous matter | 575 | 545 | 489 | 480 |
| **Bacteriological Examination.** | | | | |
| Bacteria per cc | 206 | 352 | 300 | 511 |
| Per Cent. of Positive Tests for B. Coli— | | | | |
| In 0.1 cc | ..... | ..... | ..... | ..... |
| In 1.0 cc | 2.0 | 7.7 | 4.0 | 5.8 |
| In 10.0 cc | 34.0 | 23.1 | 26.0 | 32.7 |

The figures show that the water supplied to the Borough of The Bronx has been of practically the same quality as that delivered during the previous year.

## BOROUGH OF QUEENS.

The accompanying sheets give the average analyses of the various water supplied to the Borough of Queens during the year 1908.

All of the water delivered to this Borough is from driven wells, except a portion of the Flushing water supply.

The Long Island City Pumping Station No. 2 has continued in operation during the year, and the pumping at this station has been so regulated as to keep the chlorine in the water below 100 parts per million.

Throughout the year daily analyses of chlorine have been made of the water from the North Beach Pumping Station. The pumping at this station has also been regulated so as to keep the chlorine below 100 parts per million.

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Averages, 1908,

| Place of Collection. | Physical Examination. | | | Chemical Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Nitrogen as | | | | | |
| | | | | Albuminoid Ammonia. | | | | | |
| | Turbidity. (Parts Per Million of Silica.) | Color. (Parts Per Million of Platinum.) | Odor. (Per Cent.) | In Solution. | In Suspension. | Total. | Free Ammonia. | Nitrites. | Nitrates. |
| White Lake..... | 4 | 12 | .... | .165 | .027 | .192 | .020 | .001 | .08 |
| Boyds Corner Reservoir, surface ..... | 3 | 28 | .... | .101 | .028 | .129 | .015 | .001 | .07 |
| Lake Gleneida..... | 3 | 9 | .... | .131 | .022 | .153 | .007 | .001 | .06 |
| West Branch Reservoir, surface ..... | 5 | 22 | .... | .108 | .039 | .147 | .019 | .001 | .06 |
| Lake Gilead..... | 3 | 7 | .... | .107 | .017 | .124 | .006 | .001 | .05 |
| Middle Branch Reservoir, surface..... | 4 | 21 | .... | .114 | .035 | .149 | .028 | .001 | .09 |
| Kirk Lake..... | 12 | 22 | .... | .226 | .062 | .288 | .014 | .001 | .05 |
| Lake Mahopac..... | 4 | 9 | .... | .127 | .051 | .178 | .004 | .001 | .03 |
| Sodom Reservoir, surface ..... | 5 | 19 | .... | .137 | .054 | .191 | .072 | .001 | .06 |
| Sodom Reservoir, bottom | 5 | 18 | .... | .138 | .042 | .180 | .060 | .002 | .08 |
| Bog Brook Reservoir, surface ..... | 5 | 18 | .... | .140 | .050 | .190 | .082 | .002 | .10 |
| Bog Brook Reservoir, bottom ..... | 5 | 20 | .... | .138 | .060 | .198 | .070 | .002 | .08 |
| Titicus Reservoir, surface ..... | 3 | 19 | .... | .120 | .018 | .138 | .022 | .001 | .07 |
| Titicus Reservoir, middle | 4 | 19 | .... | .090 | .022 | .112 | .027 | .001 | .06 |
| Titicus Reservoir, bottom | 5 | 22 | .... | .084 | .029 | .113 | .037 | .002 | .07 |
| Muscoot Reservoir, surface ..... | 5 | 18 | .... | .141 | .045 | .186 | .029 | .001 | .09 |
| Muscoot Reservoir, bottom ..... | 5 | 26 | .... | .131 | .039 | .170 | .103 | .002 | .12 |
| Kisco River, West Main street ..... | 5 | 27 | .... | .094 | .019 | .113 | .032 | .005 | .82 |

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Croton Watershed.

| (Parts Per Million). | | | | | | | Bacteriological Examination. | | | | Microscopical Examination. No. of Standard Units Per cc. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | B. Coli. | | | | |
| Total Solids. | Loss on Ignition. | Fixed Solids. | Chlorine. | Hardness. | Alkalinity. | Iron. | Number of Bacteria Per cc. 48 Hours at 20° C. | In 0.1 cc. % | In 1.0 cc. % | In 10.0 cc. % | Total Microscopic Organisms. | Amorphous Matter. |
| 37 | 13 | 24 | 1.6 | 13 | 12 | .. | 311 | .. | 2 | 19 | 1,190 | 233 |
| 48 | 20 | 28 | 1.4 | 21 | 18 | .04 | 443 | 2 | 10 | 33 | 111 | 181 |
| 65 | 20 | 45 | 3.8 | 42 | 34 | .03 | 1,018 | .. | 6 | 23 | 95 | 153 |
| 48 | 15 | 33 | 1.5 | 21 | 17 | .06 | 238 | .. | 4 | 17 | 1,011 | 196 |
| 51 | 16 | 35 | 2.0 | 26 | 24 | .03 | 287 | 6 | 8 | 20 | 45 | 232 |
| 51 | 16 | 35 | 1.6 | 25 | 21 | .05 | 633 | 2 | 4 | 23 | 727 | 250 |
| 56 | 20 | 36 | 1.4 | 26 | 22 | .03 | 503 | 4 | 11 | 40 | 4,311 | 374 |
| 45 | 11 | 34 | 2.7 | 19 | 16 | .04 | 177 | .. | 2 | 25 | 1,103 | 206 |
| 78 | 23 | 55 | 1.7 | 46 | 40 | .30 | 2,005 | 2 | 4 | 26 | 777 | 527 |
| 77 | 25 | 52 | 1.7 | 43 | 39 | .16 | .... | .. | .. | .. | 712 | 548 |
| 73 | 20 | 53 | 1.7 | 45 | 41 | .30 | 1,707 | 2 | 2 | 23 | 710 | 598 |
| 74 | 22 | 52 | 1.7 | 45 | 41 | .19 | .... | .. | .. | .. | 660 | 676 |
| 71 | 22 | 49 | 2.0 | 38 | 33 | .09 | 452 | 2 | 10 | 40 | 491 | 239 |
| 69 | 18 | 51 | 1.9 | 39 | 35 | .13 | 2,204 | .. | 6 | 37 | 458 | 419 |
| 76 | 26 | 40 | 1.9 | 38 | 35 | .26 | 3,392 | .. | 6 | 21 | 417 | 628 |
| 63 | 19 | 44 | 2.0 | 37 | 30 | .06 | 414 | .. | 2 | 22 | 1,338 | 235 |
| 64 | 21 | 43 | 2.0 | 36 | 32 | .09 | 198 | 2 | 2 | 29 | 832 | 329 |
| 121 | 38 | 83 | 5.2 | 56 | 45 | .15 | 5,007 | 34 | 76 | 96 | 40 | 392 |

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Averages, 1908,

| Place of Collection. | Physical Examination. | | | Chemical Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Turbidity. (Parts Per Million of Silica.) | Color. (Parts Per Million of Platinum.) | Odor. (Per Cent.) | Nitrogen as Albuminoid Ammonia. In Solution. | In Suspension. | Total. | Free Ammonia. | Nitrites. | Nitrates. |
| *Katonah Dam..... | 8 | 35 | .... | .205 | .050 | .255 | .071 | .002 | .25 |
| Croton Lake, head..... | 7 | 25 | .... | .171 | .062 | .233 | .035 | .001 | .14 |
| Croton Lake, Pine's Bridge ..... | 7 | 23 | .... | .180 | .071 | .251 | .038 | .002 | .16 |
| Croton Lake, Old Lake, surface ..... | 6 | 22 | .... | .120 | .061 | .181 | .022 | .001 | .16 |
| Croton Lake, Old Lake, bottom ..... | 5 | 23 | .... | .097 | .041 | .138 | .087 | .002 | .16 |
| Croton Lake, New Lake, surface ..... | 9 | 21 | .... | .150 | .086 | .236 | .016 | .002 | .16 |
| Croton Lake, New Lake, middle ..... | 8 | 22 | .... | .100 | .066 | .166 | .020 | .002 | .19 |
| Croton Lake, New Lake, bottom ..... | 9 | 23 | .... | .100 | .060 | .160 | .021 | .002 | .17 |
| Cornell Dam, surface... | 8 | 20 | .... | .113 | .048 | .161 | .011 | .002 | .14 |
| Cornell Dam, 20 feet... | 4 | 20 | .... | .101 | .049 | .150 | .010 | .002 | .17 |
| Cornell Dam, 40 feet... | 6 | 20 | .... | .096 | .045 | .141 | .011 | .002 | .16 |
| Cornell Dam, bottom... | 4 | 20 | .... | .080 | .046 | .126 | .014 | .004 | .16 |

* Previously Cross River at Katonah.

Averages, 1908, Reservoirs of

| Place of Collection. | Physical Examination. | | | Chemical Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Turbidity. (Parts Per Million of Silica.) | Color. (Parts Per Million of Platinum.) | Odor. (Per Cent.) | Nitrogen as Albuminoid Ammonia. In Solution. | In Suspension. | Total. | Free Ammonia. | Nitrites. | Nitrates. |
| Jerome Park Reservoir. | 4 | 16 | 0 3√ 8 m 4 Org. | .101 | .033 | .134 | .047 | .004 | .10 |
| High Bridge Reservoir. | 3 | 16 | 0 3√ 6 m 2 Org. | .077 | .025 | .102 | .017 | .003 | .18 |

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Croton Lake.

| (Parts Per Million). | | | | | | | Bacteriological Examination. | | | | Microscopical Examination. No. of Standard Units Per cc. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | B. Coli. | | | | |
| Total Solids. | Loss on Ignition. | Fixed Solids. | Chlorine. | Hardness. | Alkalinity. | Iron. | Number of Bacteria Per cc. 48 Hours at 20° C. | In 0.1 cc. %. | In 1.0 cc. %. | In 10.0 cc. %. | Total Microscopic Organisms. | Amorphous Matter. |
| 70 | 21 | 49 | 2.3 | 34 | 29 | .17 | 1,429 | 13.5 | 40.4 | 71.2 | 854 | .... |
| 69 | 22 | 47 | 2.1 | 35 | 30 | .09 | 1,386 | 2.9 | 8.6 | 44.8 | 1,180 | .... |
| 72 | 23 | 49 | 2.0 | 35 | 30 | .09 | 2,372 | 5.8 | 28.9 | 63.5 | 1,497 | .... |
| 70 | 21 | 49 | 2.0 | 35 | 30 | .07 | 727 | 3.8 | 17.5 | 46.6 | 1,312 | .... |
| 66 | 20 | 46 | 2.0 | 34 | 31 | .09 | 667 | 1.7 | 19.1 | 54.1 | 673 | .... |
| 71 | 20 | 51 | 2.0 | 34 | 29 | .09 | 815 | .. | 9.6 | 50.0 | 3,380 | .... |
| 67 | 21 | 46 | 2.0 | 34 | 30 | .07 | 629 | 1.9 | 3.8 | 40.4 | 783 | .... |
| 74 | 20 | 54 | 2.0 | 35 | 30 | .14 | 646 | 5.8 | 13.5 | 50.0 | 695 | .... |
| 65 | 20 | 45 | 2.0 | 35 | 30 | .05 | 706 | 1.0 | 7.8 | 35.9 | 1,663 | .... |
| 66 | 21 | 45 | 2.0 | 34 | 30 | .04 | 543 | 3.8 | 3.8 | 27.0 | 682 | .... |
| 63 | 23 | 40 | 2.0 | 34 | 30 | .04 | 413 | 1.6 | 4.7 | 33.1 | 779 | .... |
| 64 | 19 | 45 | 2.0 | 35 | 31 | .10 | 339 | .. | 7.7 | 27.0 | 537 | .... |

Distribution System, Manhattan.

| (Parts Per Million). | | | | | | | Bacteriological Examination. | | | | Microscopical Examination. No. of Standard Units Per cc. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | B. Coli. | | | | |
| Total Solids. | Loss on Ignition. | Fixed Solids. | Chlorine. | Hardness. | Alkalinity. | Iron. | Number of Bacteria Per cc. 48 Hours at 20° C. | In 0.1 cc. %. | In 1.0 cc. %. | In 10.0 cc. %. | Total Microscopic Organisms. | Amorphous Matter. |
| 66 | 23 | 43 | 2.0 | 35 | 30 | .20 | 227 | .. | .. | 27.0 | 750 | 362 |
| 61 | 21 | 40 | 2.0 | 33 | 29 | .20 | 321 | .. | 3.8 | 19.2 | 580 | 389 |

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| Place of Collection. | Physical Examination. | | | Chemical Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Turbidity. (Parts Per Million of Silica.) | Color. (Parts Per Million of Platinum.) | Odor. (Per Cent.) | Nitrogen as Albuminoid Ammonia. In Solution. | In Suspension. | Total. | Free Ammonia. | Nitrites. | Nitrates. |
| Central Park Reservoirs— | | | | | | | | | |
| New Reservoir..... | 4 | 17 | 6 3V<br>13 m<br>11 Org. | .121 | .015 | .136 | .027 | .004 | .14 |
| Old Reservoir: | | | | | | | | | |
| North Basin..... | 4 | 19 | 6 3V<br>19 m<br>13 Org. | .124 | .020 | .144 | .020 | .003 | .12 |
| South Basin..... | 4 | 13 | 6 3V<br>15 m<br>15 Org. | .090 | .047 | .137 | .029 | .004 | .10 |

Averages, 1908, Bronx

| Place of Collection. | Physical Examination. | | | Chemical Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Turbidity. (Parts Per Million of Silica.) | Color. (Parts Per Million of Platinum.) | Odor. (Per Cent.) | Nitrogen as Albuminoid Ammonia. In Solution. | In Suspension. | Total. | Free Ammonia. | Nitrites. | Nitrates. |
| Byram Pond..... | 3 | 15 | .... | .152 | .019 | .171 | .034 | .001 | .08 |
| Wampus Pond..... | 3 | 15 | .... | .118 | .015 | .133 | .005 | .001 | .09 |
| Wampus Pond Brook... | 3 | 18 | .... | .087 | .035 | .122 | .009 | .001 | .20 |
| Rye Pond..... | 6 | 18 | .... | .150 | .050 | .200 | .019 | .001 | .08 |
| Kensico Reservoir, surface ..... | 6 | 21 | .... | .123 | .037 | .160 | .013 | .001 | .08 |
| Kensico Reservoir, bottom ..... | 5 | 21 | .... | .134 | .020 | .154 | .043 | .001 | .07 |

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| (Parts Per Million). | | | | | | | Bacteriological Examination. | | | | Microscopical Examination. No. of Standard Units Per cc. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | B. Coli. | | | | |
| Total Solids. | Loss on Ignition. | Fixed Solids. | Chlorine. | Hardness. | Alkalinity. | Iron. | Number of Bacteria Per cc. 48 Hours at 20° C. | In 0.1 cc. %. | In 1.0 cc. %. | In 10.0 cc. %. | Total Microscopic Organisms. | Amorphous Matter. |
| 68 | 21 | 47 | 2.1 | 34 | 29 | .20 | 246 | .. | 1.9 | 17.0 | 1,076 | 400 |
| 69 | 25 | 44 | 2.1 | 133 | 28 | .19 | 253 | .. | 5.7 | 22.6 | 1,110 | 441 |
| 76 | 34 | 42 | 2.1 | 34 | 29 | .17 | 373 | .. | 9.1 | 30.3 | 1,369 | 532 |

and Byram Watershed.

| (Parts Per Million). | | | | | | | Bacteriological Examination. | | | | Microscopical Examination. No. of Standard Units Per cc. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | B. Coli. | | | | |
| Total Solids. | Loss on Ignition. | Fixed Solids. | Chlorine. | Hardness. | Alkalinity. | Iron. | Number of Bacteria Per cc. 48 Hours at 20° C. | In 0.1 cc. %. | In 1.0 cc. %. | In 10.0 cc. %. | Total Microscopic Organisms. | Amorphous Matter. |
| 47 | 13 | 34 | 2.8 | 22 | 18 | .05 | 455 | .. | 8.3 | 29.2 | 160 | .... |
| 59 | 14 | 45 | 2.4 | 33 | 31 | .03 | 267 | 1.9 | 17.3 | 42.3 | 72 | .... |
| 83 | 30 | 53 | 2.5 | 47 | 44 | .06 | 1,476 | 21.2 | 40.4 | 75.0 | 29 | .... |
| 65 | 20 | 45 | 2.6 | 31 | 26 | .08 | 195 | .. | 5.8 | 15.4 | 2,435 | .... |
| 56 | 17 | 39 | 2.4 | 28 | 22 | .05 | 336 | 1.9 | 11.5 | 32.7 | 1,050 | .... |
| 59 | 18 | 41 | 2.5 | 27 | 23 | .08 | .... | .. | .. | .. | 874 | .... |

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Averages,

| Place of Collection. | Physical Examination. | | | Chemical Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Nitrogen as | | | | | |
| | | | | Albuminoid Ammonia. | | | | | |
| | Turbidity. (Parts Per Million of Silica.) | Color. (Parts Per Million of Platinum.) | Odor. (Per Cent.) | In Solution. | In Suspension. | Total. | Free Ammonia. | Nitrites. | Nitrates. |
| Long Island City Pumping Station, No. 1... | 4 | 5 | .... | .... | .... | .010 | .109 | .044 | 4.20 |
| Long Island City Pumping Station, No. 2... | 1 | 1 | .... | .... | .... | .019 | .014 | .003 | 15.00 |
| Long Island City Pumping Station, No. 3... | .. | 2 | .... | .... | .... | .012 | .009 | .003 | 3.35 |
| North Beach Pumping Station ..... | 1 | .... | .... | .... | .... | .008 | .002 | .003 | 8.15 |
| Citizens' Water Company, Station No. 1..... | 1 | 2 | .... | .... | .... | .010 | .003 | .002 | 10.60 |
| Citizens' Water Company, Station No. 2..... | .. | 2 | .... | .... | .... | .025 | .006 | .050 | 11.13 |
| Citizens' Water Company, Station No. 3..... | 4 | 7 | .... | .... | .... | .011 | .012 | .038 | 2.16 |
| Citizens' Water Company, Stations Nos. 4 and 5 | 10 | 15 | .... | .... | .... | .005 | .009 | .001 | 4.29 |
| Citizens' Water Company, Station No. 6..... | 1 | 6 | .... | .... | .... | .022 | .206 | .097 | 10.08 |
| Citizens' Water Company, Station No. 7, Little Neck ..... | .. | 1 | .... | .... | .... | .003 | .002 | .004 | .73 |
| Douglaston Pumping Station, No. 8..... | 1 | 3 | .... | .... | .... | .005 | .003 | .001 | 1.03 |
| Bayside Pumping Station | 7 | 8 | 17 e | .... | .... | .038 | .016 | .006 | 2.23 |
| Oakland Lake, Bayside.. | 10 | 12 | 25 e | .082 | .040 | .122 | .074 | .014 | 1.62 |
| Upper Pond, Bayside.. | 4 | 10 | 1 v | .041 | .008 | .049 | .032 | .012 | 2.28 |
| Flushing Pumping Station ..... | 2 | 2 | .... | .... | .... | .016 | .007 | .005 | 4.35 |
| Flushing Pond..... | 2 | 4 | 2 v | .040 | .007 | .047 | .059 | .014 | 4.00 |
| Flushing Tap..... | 2 | 2 | .... | .021 | .005 | .026 | .009 | .001 | 3.01 |
| Whitestone Pumping Station, No. 1..... | 1 | 1 | .... | .... | .... | .014 | .008 | .001 | 4.58 |
| Woodhaven Water Company ..... | 1 | 1 | .... | .... | .... | .007 | .006 | .002 | 9.00 |
| Jamaica Water Supply Company, Station No. 2 ..... | 1 | 2 | .... | .... | .... | .009 | .008 | .003 | 3.13 |
| Montauk Water Supply Company ..... | 2 | 3 | .... | .... | .... | .006 | .019 | .002 | 4.53 |
| Queens County Water Supply Company— | | | | | | | | | |
| Raw water..... | 14 | 10 | 17 m-u | .... | .... | .021 | .012 | .003 | .13 |
| Filtered water..... | 1 | 1 | .... | .... | .... | .013 | .006 | .002 | .05 |

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1908, Queens.

| (Parts Per Million). | | | | | | | Bacteriological Examination. | | | | Microscopical Examination. No. of Standard Units Per cc. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | B. Coli. | | | | |
| Total Solids. | Loss on Ignition. | Fixed Solids. | Chlorine. | Hardness. | Alkalinity. | Iron. | Number of Bacteria Per cc., 48 Hours at 20° C. | In 0.1 cc. % | In 1.0 cc. % | In 10.0 cc. % | Total Microscopic Organisms. | Amorphous Matter. |
| 256 | .... | .... | 15.1 | 140 | 88 | 1.23 | 467 | .. | .. | 50 | .... | 19 |
| 625 | .... | .... | 82.4 | 300 | 185 | .11 | 170 | .. | .. | 33 | .... | .... |
| 362 | .... | .... | 23.1 | 211 | 142 | .10 | 4 | .. | .. | .. | .... | .... |
| 499 | .... | .... | 78.9 | 246 | 136 | .15 | 14 | .. | .. | .. | .... | .... |
| 353 | .... | .... | 12.5 | 212 | 145 | .10 | 5 | .. | .. | .. | .... | .... |
| 417 | .... | .... | 15.5 | 245 | 137 | .08 | 4 | .. | .. | .. | .... | .... |
| 175 | .... | .... | 9.8 | 115 | 89 | .44 | 306 | .. | .. | .. | .... | 9 |
| 199 | .... | .... | 8.6 | 118 | 80 | 1.03 | 66 | .. | .. | .. | .... | 18 |
| 389 | .... | .... | 24.8 | 210 | 137 | .19 | 194 | .. | .. | .. | .... | 4 |
| 81 | .... | .... | 4.9 | 42 | 40 | .12 | 30 | .. | .. | .. | .... | 3 |
| 70 | .... | .... | 4.8 | 28 | 24 | .09 | 9 | .. | .. | .. | .... | 16 |
| 119 | .... | .... | 7.1 | 50 | 36 | .39 | 557 | .. | .. | 20 | 101 | 306 |
| 118 | 34 | 84 | 7.1 | 53 | 41 | .33 | 701 | .. | .. | 20 | 713 | 617 |
| 118 | 38 | 80 | 7.3 | 53 | 41 | .34 | 918 | .. | .. | 50 | 129 | 369 |
| 130 | .... | .... | 7.9 | 55 | 32 | .08 | 326 | .. | 16 | 33 | 56 | 83 |
| 133 | 41 | 92 | 8.8 | 54 | 35 | .14 | 2,221 | .. | 25 | 50 | 105 | 154 |
| 118 | 35 | 83 | 7.0 | 51 | 34 | .21 | 105 | .. | .. | .. | 40 | 280 |
| 241 | .... | .... | 10.3 | 148 | 102 | .10 | 21 | .. | .. | .. | .... | 12 |
| 176 | .... | .... | 10.2 | 85 | 45 | .14 | 5 | .. | .. | .. | .... | .... |
| 146 | .... | .... | 16.8 | 62 | 21 | .19 | 12 | .. | .. | .. | .... | 4 |
| 230 | .... | .... | 22.0 | 130 | 77 | .15 | 19 | .. | .. | .. | .... | 4 |
| 59 | .... | .... | 4.2 | 15 | 9 | 3.42 | .... | .. | .. | .. | 66 | 45 |
| 50 | .... | .... | 4.2 | 14 | 9 | .06 | 5 | .. | .. | .. | .... | 1 |

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Pollution at Mount Kisco, Bedford, etc.

Reference was made in the annual report for last year to the passage of a bill (chapter 428, Laws of 1907), authorizing The City of New York to enter into an agreement with the Village of Mount Kisco for building the sewers and a disposal plant in order to prevent the pollution of the City's supply, and a description was given of the plan adopted by this Department, both for the installation of the sewerage system and the building of pumping station and disposal plant.

Work on the Mount Kisco sewer system was begun August 18, 1908, and shut down for the winter November 25, 1908. It is to be feared that there may be still some delay in carrying out this work, owing to legal proceedings taken against the President and Trustees of the Village of Mount Kisco to prevent the issue of the bonds by the village to provide for the payment of the sewers.

Plans of this Bureau for the disposal plant and pumping station are complete, and as soon as possession of the land is obtained we can advertise for the work.

The Electrozone plant at Brewsters has been run during the year, but, as already stated, it treats only the sewage from that portion of the village which is sewered. Owing to the lack of sufficient force, we have made no progress in the studies for the extension of the sewerage system. Owing to the work of the Aqueduct Commission, a rearrangement of the drain pipes of the disposal plant will be necessary.

At Carmel, Bedford, Lake Mahopac, North Salem and the other villages, the conditions as regards pollution from local causes remain unaltered, no change having been made in the existing laws for the protection of the water supply from pollution, to the inadequacy of which frequent reference has been made in past reports.

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## DISTRIBUTION SYSTEM.

### BOROUGHS OF MANHATTAN AND THE BRONX.

Streets and Avenues in Which Water Mains Have Been Laid During the Year 1908.

### BOROUGH OF MANHATTAN.

48-inch Pipe.

Ninth avenue, between Twenty-ninth and Fifty-ninth streets.

Sixty-second street, between Columbus avenue and Central Park West.

Columbus avenue, between Fifty-ninth and Sixty-second streets.

Central Park West, between Sixty-second and Eighty-first streets.

36-inch Pipe.

Ninth avenue, between Gansevoort and Twenty-ninth streets.

Little West Twelfth street, between High Pressure Pumping Station and Ninth avenue.

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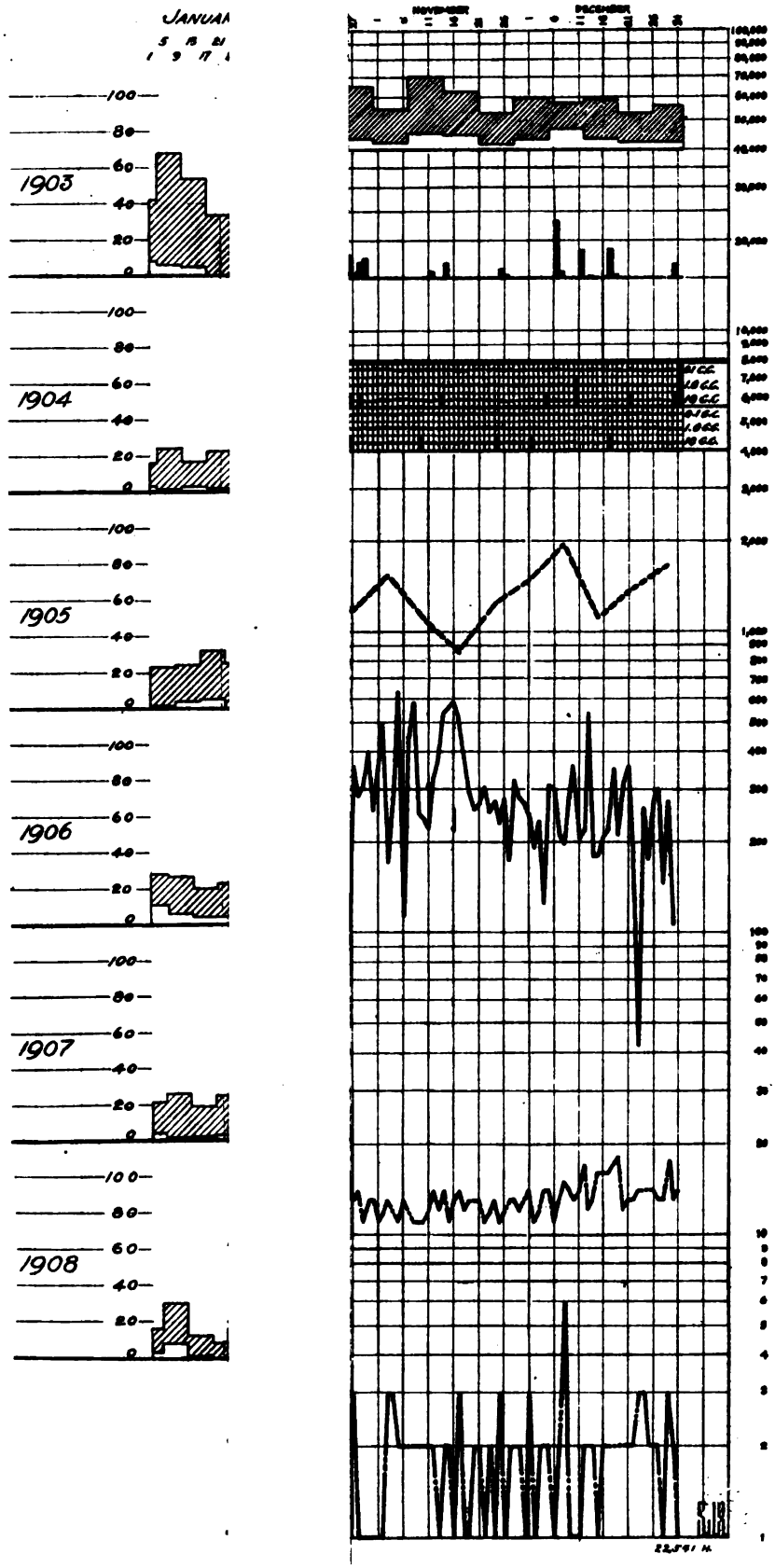


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30-inch Pipe.

New Chambers street, between High Pressure Pumping Station and Madison street.

Oliver street, between High Pressure Pumping Station and Henry street.

Henry street, between Oliver and Pike streets.

Pike street, between Henry and Division streets.

Gansevoort street, between High Pressure Pumping Station and Hudson street.

Hudson street, between Gansevoort and West Twelfth streets.

West Twelfth street, between Hudson street and Fifth avenue.

20-inch Pipe.

Twentieth street, between Tenth avenue and Marginal street.

Tenth avenue, between Twentieth and Twenty-first streets.

First avenue, between One Hundred and Tenth and One Hundred and Twenty-fifth streets.

One Hundred and Twenty-fifth street, between First and Second avenues.

12-inch Pipe.

One Hundred and Thirty-ninth street, between Broadway and Riverside drive.

Ninth avenue, between Fiftieth and Fifty-fourth streets.

Two Hundred and Fourteenth street, between Broadway and Columbus avenue.

Two Hundred and Sixteenth street, between Broadway and Columbus avenue.

Fairview avenue, between Broadway and Fort George avenue.

One Hundred and Ninety-first street, between St. Nicholas and Wadsworth avenues.

Buena Vista avenue, between One Hundred and Seventy-eighth and One Hundred and Eighty-first streets.

One Hundred and Forty-first street, between Broadway and Hamilton place.

Pleasant avenue, between One Hundred and Seventh and One Hundred and Tenth streets.

Jumel place, between One Hundred and Sixty-seventh street and Edgecombe avenue.

Audubon avenue, between One Hundred and Sixty-sixth street and St. Nicholas avenue.

One Hundred and Ninety-fifth street and Fort Washington avenue.

Fort Washington avenue, between Broadway and One Hundred and Ninety-fifth street.

Haven avenue, between One Hundred and Seventy-ninth and One Hundred and Eighty-first streets.

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New avenue, between One Hundred and Seventy-ninth and One Hundred and Eighty-first streets.

One Hundred and Seventy-ninth street, between Fort Washington and Buena Vista avenues.

One Hundred and Twenty-ninth street, between Convent avenue and St. Nicholas terrace.

One Hundred and Seventy-sixth street, between Amsterdam avenue and Audubon avenue.

One Hundred and Seventy-seventh street, between Amsterdam and Audubon avenues.

Fortieth street, between First avenue and East River.

Sixteenth street, between Tenth avenue and Marginal street.

Seventeenth street, between Tenth avenue and Marginal street.

Thirty-ninth street, between First avenue and East River.

Marginal street, between Thirteenth and Twenty-third streets.

Fourteenth street, between Tenth avenue and Marginal street.

Fifteenth street, between Tenth avenue and Marginal street.

Ninth avenue, between Gansevoort and Fifty-ninth streets.

Columbus avenue, between Fifty-ninth and Sixty-third streets.

One Hundred and Eightieth street, between Broadway and Fort Washington avenue.

Nineteenth street, between Tenth avenue and Marginal street.

4-inch Pipe (Galvanized Iron).

To hydrants on Pier (new) 11, East River.

To hydrants on pier, foot of Thirtieth street, North River.

To hydrants on pier, foot of Thirty-ninth street, North River.

To hydrants on pier, foot of Forty-eighth street, North River.

BOROUGH OF THE BRONX.

48-inch Pipe.

Jerome avenue, between One Hundred and Sixty-second and One Hundred and Ninetieth streets.

20-inch Pipe.

One Hundred and Seventy-seventh street, between Southern boulevard and Bronx River.

Crotona avenue, between Southern boulevard and Boston road.

16-inch Pipe.

Prospect avenue, between One Hundred and Sixty-third street and Boston road.

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12-inch Pipe.

Nereid avenue, between Barnes and Bruner avenues.

Exterior street, between One Hundred and Forty-sixth and One Hundred and Forty-ninth streets.

College avenue, between One Hundred and Sixty-ninth and One Hundred and Seventieth streets.

Hoe avenue, between One Hundred and Seventy-second street and Boston road.

One Hundred and Thirty-ninth street, between Southern boulevard and Locust avenue.

Taylor street, between Morris Park avenue and New Haven Railroad.

Whitlock avenue, between Tiffany street and a point 400 feet south.

One Hundred and Forty-ninth street, between Gerard avenue and Harlem River.

Two Hundred and Sixth street and Grand Concourse.

Bryant street, between Seneca and Mohawk avenues.

Bear Swamp road, between Morris Park avenue and Kissela street.

Morris Park avenue, between West Farms road and Bear Swamp road.

Chisholm street, between Stebbins and Intervale avenues.

One Hundred and Seventy-eighth street, between Creston and Ryer avenues.

One Hundred and Ninety-ninth street, between Briggs avenue and Grand Concourse.

Nelson avenue, between Macombs road and Featherbed lane.

One Hundred and Seventy-fifth street, between Nelson avenue and Macombs road.

Montgomery avenue, between One Hundred and Seventy-sixth street and Popham avenue.

Clay avenue, between One Hundred and Seventieth street and Wendover avenue

Findlay avenue, between One Hundred and Sixty-ninth and One Hundred and Seventieth streets.

Concord avenue, between One Hundred and Forty-second street and One Hundred and Forty-fourth street.

One Hundred and Ninety-sixth and One Hundred and Ninety-seventh streets, between Bainbridge and Valentine avenues.

One Hundred and Seventy-sixth street, between Crotona and Arthur avenues.

One Hundred and Eighty-eighth street, between Aqueduct and Sedgwick avenues.

Tee Taw avenue, between One Hundred and Eighty-eighth and One Hundred and Ninetieth streets.

One Hundred and Ninety-sixth street, between Jerome and Creston avenues.

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Jackson avenue, between One Hundred and Fifty-eighth street and Boston road.

One Hundred and Sixty-third street, between Prospect and Cauldwell avenues.

Perry avenue, between Two Hundred and Seventh street and Gun Hill road.

Tiebout avenue, between One Hundred and Eighty-first and One Hundred and Eighty-fourth streets.

Cameron place, between Jerome and Morris avenues.

West Farms road, between Bronx River and New Haven Railroad.

One Hundred and Seventy-sixth street, between Boston road and West Farms road.

Bathgate avenue, between One Hundred and Eighty-eighth street and Pelham avenue.

Grand Boulevard and Concourse, between One Hundred and Sixty-second and One Hundred and Sixty-sixth streets.

Manida street, between Spofford avenue and Barretto Point.

Popham avenue, between One Hundred and Seventy-sixth street and Montgomery avenue.

Burnside avenue, between Anthony avenue and Creston avenue.

Lafayette avenue, between Tiffany street and Garrison avenue.

One Hundred and Thirty-third street, between Cypress avenue and Southern boulevard.

Loring place, between Burnside avenue and One Hundred and Eightieth street.

8-inch Pipe.

Summit place, between Boston and Heath avenues.

6-inch Pipe.

Halperin street, between Main street and Blondell avenue.

Mary street, between Main street and Blondell avenue.

Blondell avenue, between Mary and Halperin streets.

One Hundred and Sixty-third street, between Brook and Melrose avenues.

Fourteenth street (Unionport), between Avenues D and E.

Beacon street, between Commonwealth and Rosedale avenues.

Railroad avenue, between Washington avenue and Green lane.

Madison street, between Columbus avenue and New Haven Railroad.

Saratoga avenue, between Eastchester road and a point 800 feet west.

Boston Post road, between Eastchester road and Schieffelin lane.

Reeds Mill road, between Oak street and a point 700 feet south.

Vyse avenue, between Home and Freeman streets.

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River avenue, between One Hundred and Forty-ninth and One Hundred and Fiftieth streets.

Crotona Park East, between Wendover avenue and Charlotte street.

St. Peters avenue, between West Farms road and Maclay avenue.

Maclay avenue, between St. Peters avenue and Overing street.

King avenue (City Island), between Elizabeth street and Sutherland street.

Main street (City Island), between end of old 6-inch pipe to end of pier.

Kingsbridge terrace, between Kingsbridge road and a point 500 feet north.

Oak Tree place, between Arthur and Lafontaine avenues.

Two Hundred and Thirty-ninth street, between Independence and Blackstone avenues.

Work Done by the Hudson Companies, at Their Own Expense.

| | |
|---|---|
| Linear feet of 12-inch pipe laid | 3,763 |
| Linear feet of 6-inch pipe laid | 245 |
| 12-inch valves set | 33 |
| 6-inch valves set | 21 |
| Double nozzle New York standard hydrants set | 17 |

Taken Out.

| | |
|---|---|
| Double nozzle "B" hydrants | 9 |
| Double nozzle "A" hydrant | 1 |
| No. 1 hydrant | 1 |

Work Done by the Pennsylvania, New York and Long Island Railroad Company, at Their Own Expense.

| | |
|---|---|
| Linear feet of 12-inch pipe laid | 875 |
| Linear feet of 6-inch pipe laid | 50 |
| 20-inch valve set | 1 |
| 12-inch valves set | 2 |
| 6-inch valves set | 2 |
| Double nozzle New York standard hydrants set | 4 |
| Double nozzle New York case hydrants set | 6 |
| Double nozzle New York case hydrants (short model) set | 3 |

Taken Out.

| | |
|---|---|
| Linear feet of 6-inch pipe | 800 |

Work Done by the Public Service Commission, at Their Own Expense.

| | |
|---|---|
| 12-inch valve set | 1 |
| 6-inch valve set | 1 |

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Work Done by the Department of Bridges, at Their Own Expense.

| | |
|---|---|
| Linear feet of 20-inch pipe laid | 1,050 |
| Linear feet of 12-inch pipe laid | 4,295 |
| Linear feet of 6-inch pipe laid | 192 |
| 20-inch valves set | 3 |
| 12-inch valves set | 23 |
| 6-inch valves set | 24 |
| Double nozzle New York standard hydrants set | 16 |
| Double nozzle New York case hydrants set | 5 |

Taken Out.

| | |
|---|---|
| Linear feet of 12-inch pipe | 259 |
| Linear feet of 6-inch pipe | 2,216 |
| 6-inch valves | 7 |
| Double nozzle "B" hydrants | 3 |
| Single nozzle hydrants | 7 |

Repairing and Renewal of Pipes, Stopcocks, etc., by the Regular Repair Companies.

| | |
|---|---|
| Additional double nozzle standard hydrants set | 50 |
| Additional double nozzle New York case hydrants set | 2 |
| Additional single nozzle New York case hydrants set | 6 |
| Additional R. D. Wood hydrant set | 1 |
| Additional Kuta hydrant set | 1 |
| Additional Ludlow hydrants set | 2 |
| Additional Walker hydrants set | 2 |
| Additional single nozzle No. 2 hydrant set | 1 |
| Hydrants set in place of defective hydrants | 997 |
| Double nozzle standard hydrants replaced | 7 |
| Double nozzle New York case hydrant replaced | 1 |
| Double nozzle New York case hydrants removed | 3 |
| Hydrants repaired (leaking or broken) | 13,271 |
| Double nozzle New York case hydrants reset | 4 |
| Hydrants found improperly closed, closed properly | 3,249 |
| Linear feet of mains laid (all sizes), in making repairs | 5,164 |
| 4-inch main relaid | 1 |
| 12-inch mains reconnected | 2 |
| Mains repaired (leaking or broken) | 887 |
| Connection made without shutting off water | 1 |
| Additional 4-inch valves set | 21 |
| Additional 6-inch valves set | 115 |
| Additional 12-inch valves set | 8 |

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| | |
|---|---|
| 6-inch gate replaced | 1 |
| 4-inch gate examined | 1 |
| 6-inch gates examined | 814 |
| 12-inch gates examined | 467 |
| 20-inch gates examined | 6 |
| New valves set in place of those defective | 46 |
| Old gate valves repaired | 2,204 |

Mains, Hydrants, etc., Abandoned.

| | |
|---|---|
| Single nozzle No. 2 hydrant | 1 |
| Single nozzle No. 3 hydrant | 1 |
| Single nozzle New York case hydrants | 3 |
| Double nozzle "A" hydrants | 2 |
| Single nozzle "A" hydrants | 3 |
| Gate valves | 27 |
| 6-inch pipe | 1,980 |
| 12-inch pipes | 2 |

City Horse Troughs.

| | |
|---|---|
| City horse troughs repaired | 278 |
| New city horse troughs set (resolution of Board of Aldermen) | 11 |
| City horse troughs removed to other locations | 7 |

Permits Issued.

| | |
|---|---|
| To tap on Croton mains, ⅝-inch to 1-inch, Manhattan | 1,074 |
| To tap on Croton mains, ⅝-inch to 1-inch, The Bronx | 1,545 |
| | 2,619 |

Permits to Place Connections Over 1 Inch on Croton Mains—

| | | |
|---|---|---|
| Manhattan. | | |
| 2-inch | 102 | |
| 3-inch | 6 | |
| 4-inch | 3 | |
| 6-inch | 3 | |
| | | 114 |
| The Bronx: | | |
| 2-inch | 8 | |
| 3-inch | 2 | |
| 4-inch | 2 | |
| 6-inch | 1 | |
| | | 13 |
| Total connections over 1 inch | | 127 |

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Two hundred and eight abandoned taps were shut off, and 995 taps were shut off on account of defective service; 128 taps, which were not on the line of inside plumbing, were removed and plugged by plumbers in the course of reconstructing old buildings and where buildings were torn down. This work was done at the expense of the plumber, who also paid for new taps, where it was necessary to use them.

During the quarter ending December 31, 1908, all hydrants in exposed places have been salted; mains at dead ends, blow offs and gates properly protected by covering. Also pipes crossing bridges properly boxed and filled with material to protect the mains from frost. Dead ends have been blown off along the river fronts of the North, East and Harlem Rivers to remove fungus or fish to prevent taps from being obstructed. All complaints, either by mail or telephone, have been investigated and letters of complaint answered.

Repairing and Renewal of Pipes, etc., by the Emergency Gangs.

| | |
|---|---|
| Additional double nozzle standard hydrants set | 181 |
| Additional double nozzle New York case hydrants set | 10 |
| Double nozzle standard hydrants replacing defective hydrants | 27 |
| Double nozzle standard hydrants in place of single nozzle No. 1 | 6 |
| Double nozzle standard hydrants in place of single nozzle No. 2 | 10 |
| Double nozzle standard hydrant in place of single nozzle No. 3 | 1 |
| Double nozzle standard hydrants in place of single "A" | 3 |
| Double nozzle standard hydrants in place of double "A" | 2 |
| Double nozzle standard hydrants in place of double "B" | 3 |
| Double nozzle standard hydrant in place of case hydrant | 1 |
| Double nozzle standard hydrant in place of Gear hydrant | 1 |
| Double nozzle New York case hydrants replacing defective hydrants | 2 |
| Double nozzle New York case hydrants in place of single nozzle No. 2 | 2 |
| Single nozzle New York case hydrants replacing defective hydrants | 4 |
| Single nozzle New York case hydrants in place of single nozzle No. 1 | 3 |
| Double nozzle New York case hydrant repaired | 1 |
| Double nozzle standard hydrants reset | 10 |
| Double nozzle New York case hydrant reset | 1 |
| Single nozzle No. 1 hydrant reset | 1 |
| Double nozzle standard hydrants replaced | 1 |
| Double nozzle New York case hydrant replaced | 1 |
| Single nozzle No. 1 hydrant replaced | 1 |
| Single nozzle No. 2 hydrant replaced | 1 |
| Double nozzle "A" hydrant replaced | 1 |
| Double nozzle "A" hydrant removed | 1 |
| Double nozzle New York case hydrants reconnected | 4 |
| Linear feet of new 4-inch pipe laid | 127 |
| Linear feet of new 6-inch pipe laid | 4,112 |

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| | |
|---|---|
| Linear feet of new 8-inch pipe laid | 6 |
| Linear feet of new 12-inch pipe laid | 530 |
| Linear feet of 20-inch pipe laid | 33 |
| 4-inch mains repaired | 2 |
| 6-inch mains repaired | 39 |
| 8-inch main repaired | 1 |
| 12-inch mains repaired | 14 |
| 16-inch main repaired | 1 |
| 20-inch mains repaired | 6 |
| 24-inch mains repaired | 4 |
| 30-inch mains repaired | 7 |
| 36-inch mains repaired | 5 |
| 48-inch mains repaired | 3 |
| Additional 4-inch valve set | 1 |
| Additional 6-inch valves set | 51 |
| Additional 12-inch valves set | 8 |
| Additional 20-inch valves set | 3 |
| 6-inch valves repaired | 40 |
| 8-inch valve repaired | 1 |
| 12-inch valves repaired | 21 |
| 20-inch valves repaired | 9 |
| 24-inch valves repaired | 2 |
| 30-inch valve repaired | 1 |
| 36-inch valves repaired | 2 |
| 6-inch valves replaced | 2 |
| 20-inch valve replaced | 1 |
| 4-inch valves inspected, greased and cleaned | 6 |
| 6-inch valves inspected, greased and cleaned | 811 |
| 8-inch valves inspected, greased and cleaned | 5 |
| 10-inch valves inspected, greased and cleaned | 2 |
| 12-inch valves inspected, greased and cleaned | 516 |
| 16-inch valve inspected, greased and cleaned | 1 |
| 20-inch valves inspected, greased and cleaned | 190 |
| 24-inch valves inspected, greased and cleaned | 14 |
| 30-inch valves inspected, greased and cleaned | 40 |
| 36-inch valves inspected, greased and cleaned | 97 |
| 48-inch valves inspected, greased and cleaned | 44 |
| Connections made without shutting off water | 7 |
| Taps changed from old 6-inch to new 12-inch mains | 137 |
| Additional taps | 2 |

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| | |
|---|---|
| Taps shut off | 14 |
| New drinking fountains set | 2 |

Mains, etc., Abandoned.

| | |
|---|---|
| Linear feet 4-inch pipe | 200 |
| Linear feet of 6-inch pipe | 2,430 |
| Single nozzle No. 1 hydrants | 2 |
| 6-inch valves | 2 |

Four gangs of men have been employed exposing and investigating service pipes to gas plants and other corporations.

SUMMARY.

Pipe Laid.

| Diameter. | Total Linear Feet, December 31, 1907. | Linear Feet Laid From December 31, 1907, to December 31, 1908. | Total Linear Feet, December 31, 1908. |
|---|---|---|---|
| 60-inch | 700 | 104 | 804 |
| 48-inch | 208,909 | 26,305 | 235,214 |
| 36-inch | 269,894 | 2,803 | 272,697 |
| 30-inch | 52,882 | 1,653 | a 53,725 |
| 24-inch | 11,577 | 31 | 11,608 |
| 20-inch | 371,241 | 21,329 | 392,570 |
| 16-inch | 28,942 | 4,362 | 33,304 |
| 14-inch | 2,050 | ..... | 2,050 |
| 12-inch | 1,656,870 | 111,088 | b 1,754,970 |
| 10-inch | 12,810 | ..... | 12,810 |
| 8-inch | 41,496 | 326 | 41,822 |
| 6-inch | 3,379,633 | 28,166 | c 3,388,718 |
| 4-inch | 176,558 | 3,739 | d 176,472 |
| Total | 6,213,562 | 199,906 | 6,376,764 |
| Miles | 1,176.80 | 37.86 | *1,207.72 |

a. 810 linear feet 30-inch pipe abandoned.
b. 12,998 linear feet 12-inch pipe abandoned.
c. 19,081 linear feet 6-inch pipe abandoned.
d. 3,825 linear feet 4-inch pipe abandoned.
* 36,714 linear feet, or 6.95 miles, abandoned during year 1908.

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## Gate Valves Set.

| Diameter. | Total, December 31, 1907. | From December 31, 1907, to December 31, 1908. | Total, December 31, 1908. |
|---|---|---|---|
| 48-inch | 52 | 10 | 62 |
| 36-inch | 87 | 2 | 89 |
| 30-inch | 37 | 5 | 42 |
| 24-inch | 16 | .... | 16 |
| 20-inch | 357 | 35 | 392 |
| 16-inch | 26 | 3 | 29 |
| 14-inch | 1 | .... | 1 |
| 12-inch | 4,138 | 596 | a 4,727 |
| 10-inch | 12 | .... | 12 |
| 8-inch | 211 | 4 | 215 |
| 7-inch | 1 | .... | 1 |
| 6-inch | 11,711 | 886 | b 12,555 |
| 4-inch | 329 | 34 | c 361 |
| Total | 16,978 | 1,575 | 18,502 |

a. 7 12-inch gate valves discontinued.
b. 42 6-inch gate valves discontinued.
c 2 4 inch gate valves discontinued.

## Hydrants Placed.

| Pattern. | Total, December 31, 1907. | From December 31, 1907, to December 31, 1908. | Total, December 31, 1908. |
|---|---|---|---|
| Nos. 1, 2 and 3 | 3,293 | 1 | a 3,143 |
| Victor | 127 | .... | b 122 |
| A | 4,327 | .... | c 4,253 |
| B | 1,759 | .... | d 1,731 |
| Double Nozzle A | 511 | .... | e 497 |
| Triple Nozzle S | 206 | .... | 206 |
| Double Nozzle S | 3,015 | 988 | 4,003 |
| Double Nozzle C | 2,688 | 44 | f 2,721 |

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| Pattern. | Total, December 31, 1907. | From December 31, 1907, to December 31, 1908. | Total, December 31, 1908. |
|---|---|---|---|
| Single Nozzle C | 899 | 69 | g 961 |
| Miscellaneous | 743 | 16 | h 733 |
| Total | 17,568 | 1.118 | 18,370 |

a. 151 Nos. 1, 2 and 3 hydrants removed.
b. 5 Victor hydrants removed.
c. 74 A hydrants removed.
d. 28 B hydrants removed.
e. 14 Double Nozzle A hydrants removed.
f. 11 Double Nozzle Case hydrants removed.
g. 7 Single Nozzle Case hydrants removed.
h. 26 miscellaneous hydrants removed.

## Maps and Records.

The work of the records and plans of the distribution system has been carried on vigorously and the entire Borough of Manhattan has been completed. The maps covering the Borough of The Bronx will be started at once. The surveys in The Bronx have been completed from the Harlem River to One Hundred and Forty-seventh street.

## Mains.

During the past year 37.86 miles of mains have been laid; those in Manhattan being principally in the Washington Heights section and also in the Chelsea section south of Twenty-third street along the water-front.

There have also been laid distribution mains covering a large area of The Bronx and east of The Bronx.

Additional fire hydrants to the number of 1,118 have been installed in various parts of Manhattan and The Bronx and also 1,575 valves have been placed.

The 48-inch water mains in Seventh avenue, between One Hundred and Fifteenth and One Hundred and Fifty-third streets, have been completed and inspected, and by the use of these mains the water pressure in the Harlem section, north of One Hundred and Twenty-fifth street, has been increased approximately 12 pounds.

The two 48-inch mains in Jerome avenue have been practically completed and are now undergoing the necessary tests before acceptance.

The 48-inch water main in Columbus avenue, Sixty-second street and Central Park West has been completed and will be the means of materially increasing the pressure in our water system in the western section of the Borough of Manhattan, south of Fifty-ninth street.

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### Repair Gangs.

Arrangements have been substantially completed for the subdividing of the district covered by Company No. 1, Repairs to Water Mains, which district comprises the whole portion of Manhattan from the Battery to Houston street, and from the North to the East Rivers, into two districts, with the division line at Broadway and the maintaining of the present headquarters in Worth street and the placing of additional repair company headquarters to take care of the section west of Broadway at No. 7 North Moore street. This will undoubtedly result in enabling us to carry on the work of repairs in this district more satisfactorily and expeditiously.

Owing to the enormous increase in the construction of new buildings in the Washington Heights section and also in the Borough of The Bronx, it is absolutely necessary that additional funds be granted to this Department giving us the means to lay mains in streets in the sections named where there are no water mains at present in order to keep up with the growth of the City and not to deter public improvement.

### Testing of Hydrants.

A careful survey and examination of the hydrants has been commenced in order to determine their efficiency, the need of additional hydrants and also to paint, with a distinctive color, those hydrants yielding 600 gallons per minute or more, as a means to aid the Fire Department in their work. The district from the Battery to One Hundred and Third street and from the East River to the Hudson River, has already been covered and 4,658 hydrants, yielding 600 gallons or more, located. These hydrants will be painted with a special color as above stated.

## BOROUGH OF QUEENS.

### Supply.

The pumping and boiler plants at Station No. 1, First Ward, are in good repair. As already stated, no other increase in the supply can be obtained except what may be secured by the cleaning out of the present well system.

The average daily yield for the year from this station was 664,222 gallons.

The work on the fence to properly inclose and protect the station and grounds adjacent thereto, was satisfactorily completed on August 4, 1908.

Pumping Station No. 2, since October, has been in service only occasionally as explained hereafter, owing to the condition of the boiler. This station has always been an expensive one to operate.

The 16-foot well at Pumping Station No. 2 was duly fenced and covered to prevent the formation of vegetable growth and to prevent accidents.

Pumping Station No. 3 is in good repair and its average daily yield has been 766,000 gallons, which is an increase of 196,000 gallons per day over the yield of 1907, and which may be practically considered as the maximum yield obtainable there, espe-

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cially as the station is being rapidly isolated owing to the building of the track yards of the Pennsylvania, New York and Long Island Railroad Company, who have made an offer to purchase the station.

The necessary surveys were completed for laying out a pipe line from Manhattan across the East River, at Blackwells Island, connecting with the distribution system at Long Island City and for the additional mains in Long Island City leading to a standpipe which would give sufficient pressure both for domestic purposes and efficient fire protection, and the standpipe was also located. This plan was outlined in last year's report in connection with a possible emergency supply for Queens from our Ninety-eighth Street Pumping Station in Manhattan. Should it be deemed advisable to carry out this plan, the contract for the work can therefore be readily prepared and advertised.

The work on the gate house and the concrete and wrought iron fence around the standpipe located at North Sixteenth street and High street, at College Point, was satisfactorily completed on August 4, 1908.

The average daily yield of the Flushing Pumping Station in the Third Ward during the past year was 1,717,000 gallons, an increase of somewhat over 100,000 gallons over the average daily yield of 1907.

The machinery is in fair repair, with the exception of the piping and large pump, which are about to be overhauled.

The operation of this station, where the water is brought from the wells by air lift to the main pumps, was fully discussed in last year's report and the comparatively large expense due to this process, as well as the rapid falling off in duty, were explained. The present plant, consisting of one 3,000,000-gallon engine, on the duty trial showed a duty in excess of 110,000,000 foot-pounds of work per 1,000,000 British thermal units. In 1907, for an average daily pumping of 1,610,400 gallons, the duty based on the total net head on the pump was but slightly in excess of 18,680,000 foot-pounds of work per 100 pounds of coal, which was a falling off of slightly over 3,600,000 foot-pounds of work as compared with 1906, when the average yearly duty was slightly in excess of 22,286,000 foot-pounds of work per 100 pounds of coal used. For 1908, with an average daily pumping of 1,717,000 gallons, the average duty in foot-pounds per 100 pounds of coal was, in round numbers, 20,614,000. This duty is still slightly over 1,500,000 foot-pounds of work below the duty obtained in 1906 and about 2,000,000 foot-pounds of work over the average duty obtained in 1907. The duty in the latter case is probably due to less need of using the air compressor in operating the station, owing to the increased yield at Bayside, i. e., the number of air compressor hours in the year was decreased.

At the Bayside Pumping Station the pumping machinery is in fairly good condition. The average daily yield during the year was 1,380,000 gallons, thus showing an increase of about 200,000 gallons over the yield obtained in 1907 and about 500,000 gallons over the average daily yield in 1906. The duty was also considerably increased,

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being, in round numbers, 36,068,000 foot-pounds per 100 pounds of coal, or an increase of about 5,500,000 foot-pounds over the duty obtained in 1907, which was 30,425,000 foot-pounds. The increased duty was largely due to the increased amount pumped and was contributory to the increased duty obtained at the Flushing Pumping Station. The bulk of the increased pumpage was obtained during the last quarter of the year, as shown by the report for that quarter herein, which shows an average daily yield of over 1,555,000 gallons with a corresponding duty of 38,770,000 foot-pounds of work, thus making an increase in the yield of over 373,000 gallons and an increase in the duty of over 8,350,000 foot-pounds per 100 pounds of coal.

At the Whitestone Pumping Station the machinery is in fair condition. It was run regularly during the present year, with a resulting average daily yield of about 417,000 gallons, an increase of about 36,000 gallons over the average daily yield in 1907. As stated in the previous report, this amount is about all that can be obtained from the present wells, which need general cleaning and overhauling.

This plan is the most expensive one in operation of the six municipal plants in the First, Second and Third Wards of the Borough of Queens.

Owing to the general unsatisfactory condition of the supply in the First, Second and Third Wards of the Borough of Queens, and particularly in Long Island City (First Ward), from the residents of which numerous complaints were constantly received, I prepared, in compliance with your directions, and submitted to you on November 27, 1908, a schedule of the various sources of supply of water furnished in those wards, with particular reference to existing conditions in Long Island City, from which I quote as follows:

"The Borough of Queens comprises the following wards:

"First Ward—The boundaries of this ward are the old ones of Long Island City. It is supplied by this Department from three municipal stations, i. e., Station No. 1 at Blissville, Station No. 2 at Steinway and Station No. 3 at Dutchkills, and with water purchased by the City from the Citizens' Water Company and from the Bowery Bay Building and Improvement Company, and delivered by these companies at the City line.

"Second Ward—This ward comprises the old township of Newtown, and includes the villages of Newtown, Corona, Elmhurst, North Beach, Woodside, Winfield and Maspeth. It is supplied by the Citizens' Water Company. The Bowery Bay Building and Improvement Company supply their own buildings in this ward. This company has no franchise.

"Third Ward—This ward is the old township of Flushing and comprises the villages of Flushing, Ingleside, College Point, Whitestone and Bayside. It is supplied from three municipal stations, at Whitestone, Bayside and Flushing. Lately a connection has been made with the mains of the Citizens' Water Company, to obtain a temporary supply, if needed, in case of repairs to our pumping station at Bayside, pending the remodelling of that station.

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"Fourth Ward—This is the old township of Jamaica, and comprises Jamaica, Woodhaven, Richmond Hill, Morris Park and Queens. It is supplied by the Jamaica Water Company and the Woodhaven Water Company.

"Fifth Ward—This comprises that portion of the old Town of Hempstead lying within the Borough of Queens, and includes the villages of Far Rockaway, Rockaway Beach, Lawrence, Cedarhurst, Arverne and Edgemere. It is supplied by the Queens County Water Company. The remaining portion of the old Town of Hempstead lies within the limits of the new County of Nassau.

"Supply Furnished to Long Island City.

"First Ward.

"From Municipal Stations.

"The following table shows the supply furnished to the First Ward from the three municipal stations, cost, etc., the figures used herein being those corresponding to the year terminating September 30, 1908:

| | "Station No. 1. | Station No. 2. | Station No. 3. | Total. |
|---|---|---|---|---|
| "Lift, feet | 172 | 148 | 142 | ..... |
| "Average daily delivery, gallons | 677,000 | 507,000 | 734,000 | 1,918,000 |
| "Cost per million gallons delivered | $55 68 | $67 98 | $47 06 | $55 63 |
| "Cost per foot-million gallons | $0 324 | $0 462 | $0 331 | ..... |

"The delivery in all cases has been computed by pump displacement and the cost given is simply that of operation and does not include, therefore, interest or Sinking Fund charges, which could not be estimated owing to lack of sufficient data in our records.

"From Citizens' Water Company.

"The amount paid to the Citizens' Water Company for water delivered during the year expiring September 30, 1908 (exclusive of fire hydrant rentals), was $138,993.13, which at $65 per million gallons corresponds to a total delivery of 2,138.35 million gallons, or 5.8585 million gallons per day.

"From Bowery Bay Building and Improvement Company.

"The amount paid to this company for water furnished during the same year, was $16,381.04, which, at $65 per million gallons, corresponds to 252.01 million gallons, or 0.6904 million gallons per day. This company has no franchise.

"Under the contract made with the Citizens' Water Company, the City pays $65 per million gallons of water delivered at the City's mains under a pressure 'of seventy pounds above tide water at that point.' This corresponds to about 162 feet above tide water.

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"Under the contract with the Bowery Bay Building and Improvement Company, this company is to be paid at the rate of $65 per million gallons for the water delivered under a pressure of eighty pounds at the point of delivery over tide water.

"Average Daily Supply.

"The water furnished from the three municipal stations is estimated by pump displacement, so that the results obtained, and given above, are in excess of the true amount delivered. This error will be more particularly referred to hereafter. The water purchased from the two water companies is measured by meter.

"On the basis above given, subject to correction as regards the measurement of the supply from the municipal stations, the total average daily amount furnished to Long Island City, during the year under consideration, was, in round numbers, 8,467,000 gallons.

"Water Rates.

"The rates charged by this Department for the water consumed in Long Island City are the same as those charged in the Boroughs of Manhattan, The Bronx and Brooklyn, i. e., ten cents per hundred cubic feet, or about $133 per million gallons for water when metered, and the frontage rates prescribed for the different classes of buildings under the regulations of the Department.

"In the Second Ward, supplied by the Citizens' Water Company, the latter charge to their private consumers, with whom they deal directly, by frontage rates and by meter. The frontage rates are exactly the same as those established by the City in the Boroughs of Manhattan, The Bronx and Brooklyn, but while in these Boroughs the amount of water used is not limited, in the Second Ward the charge is based on the amount of water consumed, so that the latter is practically metered. Thus, the frontage charges made by this Department in New York, for a building of from 20 to 22½ feet front and five stories high, is $11 a year, which corresponds to $5.50 for six months. The Citizens' Company also charges $5.50 as the frontage rate on such building for six months, but the amount of water is limited and the charge computed as follows:

| | |
|---|---|
| "For the first 1,000 cubic feet of water at 30 cents per hundred..... | $3 00 |
| "For the second 1,000 cubic feet of water at 20 cents per hundred..... | 2 00 |
| "For 500 cubic feet of water additional, at 10 cents per hundred..... | 50 |
| "Total allowed, 2,500 cubic feet, for..... | $5 50 |

—"and if a larger amount of water is used, the consumer is charged at the rate of ten cents per hundred cubic feet for the excess. To large consumers of water, using not less than one million cubic feet per month, the Citizens' Water Company charges a flat rate of ten cents per hundred cubic feet, which is equivalent to a minimum charge of $1,000 per month. I have been informed that there are only three such consumers in the territory supplied by the Citizens' Water Company. Smaller con-

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sumers will be charged on the basis established to determine the frontage rates and quoted above.

"While this Department collects the water rates annually, the bills rendered by the Citizens' Water Company are payable and collected semi-annually.

"Cost of Water to the City.

"The cost to the City of the water supplied to consumers in Long Island City and purchased from the two water companies, is, as already stated, sixty-five dollars ($65) per million gallons at the point of delivery, the above amount, therefore, not including expenses of distribution and collection.

"The cost of the water supplied from the three municipal stations, also at the points of delivery, has already been given, but without further explanation the figures hereinbefore reported would be misleading. As already stated, the estimates of the pumping are based simply on pump displacement, so that the results are in excess of actual delivery and, therefore, the figured cost given is too low. Furthermore, the latter does not include, as it should, a proper allowance for interest and Sinking Fund charges, which could not be calculated, owing to the absolute lack of data in our records. If these two items were properly determined and included in the cost of water from the municipal stations, the latter would be considerably increased, the average for the three stations probably exceeding the price now paid per million gallons to the private companies. Even omitting the two items herein mentioned, it will be noticed that the cost per million gallons at Station No. 2, which relatively is by far the most expensive of the three mentioned, exceeds the purchase price of the water obtained from the private companies. Similar remarks apply to the Whitestone Station, one of the three municipal plants supplying the Third Ward. With a lift of 169 feet, the average daily delivery from that station for the year ending September 30, 1908, was only 428,640 gallons, so that the cost per million gallons, estimating the delivery as in the three preceding cases, was $71.95 and the cost per foot-million gallons $0.427. The total daily average supply from the above four stations was 2,346,600 gallons, at an average cost per million gallons delivered, as already explained, of $58.62.

"This last statement, aside from the inferior character of the equipment originally installed in the pumping stations in Queens, and the poor condition of these plants when the present Borough entered to form part of the Greater New York, sufficiently explains the extraordinarily high cost of maintenance and operation of these stations. Thus, for a small supply, amounting only to slightly over two million gallons in twenty-four hours, we have to maintain and operate four separate stations, each with its own separate force and a resulting salary account entirely out of proportion to the yield. Furthermore, not only is the cost of the water furnished from these stations relatively exorbitant, but the quality of the water is often unsatisfactory. Owing to their proximity to tide water and the formation of the soil, the under-

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ground supply at these stations is liable to be affected by the infiltration of sea water, which, unless the pumping is carefully watched to prevent an overdraught, charges the water with such an amount of chlorine as to make it unsatisfactory for domestic consumption, unfit for many industrial purposes and destructive to boilers and machinery. Thus, we have often to replace our boiler tubes, particularly at Station No. 2, in Long Island City, and it will be remembered that on November 8, 1902, a serious boiler explosion, in which two lives were lost, destroyed that station and that the disaster was attributed, at the time, to the condition of the boilers caused by the quality of the water as above explained, and cost the City about $20,000.

"I renew, therefore, the recommendation made by me in previous reports, to discontinue the operation of the above mentioned municipal plants in Queens, and particularly Nos. 1 and 2 at Long Island City and the Whitestone plant, as soon as the conditions of the supply render this measure practicable. The land and buildings now occupied by these stations, especially in the case of Station No. 2, could probably be sold to advantage.

"Present and Prospective Sources of Supply.

"The inadequacy of the water supply furnished generally throughout Queens, and which constitutes a serious barrier to the growth and development of that Borough, is felt in no other ward as severely as in Long Island City (First Ward), where the supply is now insufficient even for present needs, both as regards quantity, pressure and, at least partially, quality, and therefore unsatisfactory to private consumers, prejudicial to manufacturers and so inadequate to secure proper fire protection as to have been the subject of particular notice and severe condemnation in the official report of the New York Board of Fire Underwriters.

"Leaving now, for obvious reasons, out of consideration sources of supply outside of Long Island City, or along the north shore and in Suffolk County, it may be stated that practically all the water producing land near Long Island City, available for further development of the supply, at reasonable cost, is now controlled by the Citizens' Water Company, which, as already shown, sold during the year ending September 30, 1908, to this Department, about seventy per cent. (70%) of the water supplied to Long Island City, or say 5.86 million gallons per twenty-four hours, at a cost (exclusive of fire hydrant rentals) of $138,993.13, besides furnishing directly a trifling amount to private consumers. This company also supplies ten or twelve consumers in the Third Ward, and the whole of the Second Ward, where the consumption for the year above mentioned, averaged, according to figures furnished to us by the company, about 7,400,000 gallons per twenty-four hours. On this basis, the total quantity supplied by the Citizens' Water Company to the First and Second Wards amounted, in round numbers, to about 13,260,000 gallons per twenty-four hours during the year under consideration.

"I annex hereto (Appendix No. 1) a tabulated statement, furnished by the Citizens' Water Company, of the stations it has in operation, with the estimated yield of each.

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"In addition to the possible supply of five million gallons per day, from the Great Neck and Douglaston stations, referred to at the end of Appendix No. 1, the Citizens' Water Company have also offered to furnish water from the station they have recently established north of Valley Stream, on the south side of Long Island.

"Under the latter plan, the company have proposed to deliver their water at Valley Stream, whence it would be pumped into the Ridgewood reservoirs, the company reserving the right to take from the City mains, at or near Cypress and Myrtle avenues, such an amount of water as it may need for its own consumers, so as to fulfill its charter obligations, without setting a limit to the quantity it will thus take from the City's mains, except that that quantity shall not exceed the amount furnished at Valley Stream. The latter amount has not been specified. In fixing the price to be paid by the City to the company for water delivered by the latter at Valley Stream, and the price to be paid by the company to the City for water delivered from the Ridgewood reservoirs at Cypress and Myrtle avenues, provision would be made for the expense to the City of pumping and delivering the water received at Valley Stream into the Ridgewood Reservoir.

"The adoption of this plan to relieve Long Island City seems to me unadvisable. Under it, the water is to be drawn from the watershed that furnishes the Brooklyn supply, and the latter, therefore, will be affected, to a greater or lesser extent, and it is to be delivered through the Brooklyn conduit and pumped by the Ridgewood engines into the Brooklyn reservoir. As the supply of the Borough of Brooklyn is barely adequate for its present needs and its existing conduit and pumping capacity are also insufficient and in process of extension, it seems to me that if the proposal of the company to furnish water at Valley Stream is to be accepted, it would be wiser to use it for the supply of Brooklyn.

"The unofficial proposition to furnish about five million gallons per day from Great Neck and Douglaston stations, for additional supply to Long Island City, was predicated on the assumption that the City would furnish and lay the necessary mains to deliver that water from the above stations, the company claiming that the expense of these mains would be considerable and that they would be loath to incur this expense, unless a contract for a number of years could be agreed upon. * * *"

In accordance with the policy heretofore advocated in this Department and which now prevails throughout all the great cities of the United States, with scarcely an exception, of exclusive municipal ownership and control of the water supply, and the endless complaints made against the water company by its private consumers in the First Ward, I stated in the above report that it would be advisable to acquire the works and franchises of the Citizens' Water Company, provided, however, that this could be done at a reasonable and fair valuation, and that not only the present, but the prospective conditions of the general supply of the City should be taken into account in arriving at that valuation.

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Appendix No. 1—To accompany report submitted to Hon. John H. O'Brien, Commissioner, by I. M. de Varona, Chief Engineer, Department of Water Supply, Gas and Electricity, dated November 27, 1908.

SCHEDULE SHOWING NUMBER OF STATIONS THAT THE CITIZENS' WATER COMPANY HAS IN OPERATION, AND ESTIMATED CAPACITY OF THE SAME.

Furnished on Behalf of the Citizens' Water Company by its Engineer, November 11, 1908.

The Citizens' Water Company has in operation the following pumping stations:

| | Gallons. |
|---|---|
| Station No. 1, situated on Claremont avenue, Elmhurst, L. I. It pumps, in twenty-four hours, about | 750,000 |
| Station No. 2, situated on Jackson avenue, near Woodside, L. I. It pumps, in twenty-four hours, about | 1,800,000 |
| Station No. 3, situated on Union turnpike, near Hoffman boulevard, Forest Hills, L. I. It pumps, in twenty-four hours, about | 4,000,000 |
| Station No. 4, situated on Flushing meadows, Forest Hills, L. I. It pumps, in twenty-four hours, about | 1,800,000 |
| Station No. 5 is no longer in running order, the wells of this station being connected to No. 4 pumping station. | |
| Station No. 6, situated at Maspeth, L. I. It pumps, in twenty-four hours, about | 350,000 |
| Station No. 7, situated on Cuttermill road, Great Neck, L. I. Not running. | |
| Station No. 8, situated at the head of Little Neck Bay, Douglaston, L. I. It pumps, in twenty-four hours, about | 4,000,000 |
| This makes, at present, a total, per twenty-four hours, of about | 12,700,000 |

Stations Nos. 1 and 6 are only running during the day time, from 7.30 a. m., to 6 p. m.

The remaining stations run night and day, with the exception of Station No. 7, situated at Great Neck, L. I., which is not in operation.

In the summer time water is pumped at the rate of about 15,000,000 gallons per twenty-four hours. on an average.

The amount of water supplied to private consumers in the First Ward is unimportant.

The water furnished to the company's private consumers in the Second Ward, Borough of Queens, for the year ending September 30, 1908, averaged from 7,300,000 gallons to 7,500,000 gallons per twenty-four hours.

There are about ten or twelve consumers in the Third Ward, but the supply furnished to them is unimportant.

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The company, on September 14, 1908, estimated that an additional supply of about 5,000,000 gallons per day might be obtained at that time from Great Neck and Douglaston stations, which could be made available for additional supply to Long Island City, if the City would lay the necessary mains.

BOROUGH OF QUEENS.

Yearly Consumption.

| From the Municipal Stations. | Total Gallons 1908. | Average Per Day. |
|---|---|---|
| Pumping Station No. 1 | 243,000,000 | 664,222 |
| Pumping Station No. 2 | 141,000,000 | 515,563 |
| Pumping Station No. 3 | 280,000,000 | 765,670 |
| Flushing Pumping Station | 628,000,000 | 1,717,134 |
| Bayside Pumping Station | 505,000,000 | 1,380,467 |
| Whitestone Pumping Station | 153,000,000 | 416,774 |
| From Private Companies. | | |
| Citizens' Water Supply Company | 2,251,773,000 | 6,152,300 |
| Bowery Bay Building and Improvement Company | 203,957,000 | 557,350 |
| | 4,405,730,000 | 12,169,380 |

N. B.—The above figures can only be considered as approximate, the computations from the municipal stations being based on pump displacements, and those from the private companies being based on bills rendered as per meter records.

Distribution.

The condition of the system in the First and Second Wards, Borough of Queens, is very good and the work of the repair gangs, considering the number of men, has been satisfactory.

Several contracts in this Borough were awarded by the Bureau of Highways without making any provision for taking care of the water mains. This failure on their part has entailed considerable extra work on the part of the repair gang and necessitated the allowance of a good deal of overtime. It does not seem that this course on the part of the Bureau of Highways is warranted, as it subjects this Department to pay for a portion of the work for which the Bureau of Highways should provide. The matter, some time ago, was called to the attention of the former Borough President and the Chief Engineer of the Bureau of Highways, and at that time we had the promise that a proper clause would be inserted by them in their future contracts which would relieve us of this burden.

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The work under the contracts with James P. Graham, in the First and Second Wards has not proceeded by any means satisfactorily, and we have had considerable trouble with the contractor in our efforts to secure much better progress. Although long after the contract time, the work of both contracts is practically complete, with the exception, however, of the connections of the hydrants to the sewers and some minor details. Unless much better disposition on the part of this contractor is shown to close up the work, it may be advisable, even at this late day, to subcontract the remaining portion.

The plans and specifications for the extension of the distribution system on Franconia, Mitchell, Crocheron, Myrtle and other streets and avenues, both in the First and Second Wards, were not only completed, but actually printed and ready for advertising, but delay in securing the necessary appropriation has hitherto prevented our calling for bids.

Statement of Fire Hydrants for Which the City Pays Rental to Private Water Companies.

| Name of Company. | Rate. | Number in Use January 1, 1908. | Number Set in 1908. | Total. | Annual Cost. |
|---|---|---|---|---|---|
| Citizens' Water Supply Company..... | $25 00 | 100 | .... | 100 | $2,500 00 |
| Citizens' Water Supply Company..... | 20 00 | 589 | 35 | 624 | 12,480 00 |
| Citizens' Water Supply Company..... | 18 00 | 140 | .... | 140 | 2,520 00 |
| Citizens' Water Supply Company..... | 15 00 | 12 | .... | 12 | 180 00 |
| Jamaica Water Supply Company..... | 18 00 | 1,013 | 147 | 1,160 | 20,800 00 |
| Queens County Water Company..... | 20 00 | 356 | 28 | 384 | 7,680 00 |
| Woodhaven Water Supply Company..... | 18 00 | 747 | 27 | 774 | 13,932 00 |
| Total..... | | | | | $60,172 00 |

Work Done by Repair Gangs.

| Kind of Work. | First Ward. | Third Ward. | Kind of Work. | First Ward. | Third Ward. |
|---|---|---|---|---|---|
| Taps made..... | 499 | 285 | Times water was turned on new pipe lines..... | 26 | 16 |
| Leaks repaired..... | 41 | 82 | | | |
| Stop-cocks repaired..... | 77 | 77 | Stop-cocks removed..... | 7 | .. |
| Hydrants repaired..... | 916 | 195 | Openings repaired..... | 7 | .. |
| Gate boxes repaired..... | 13 | 67 | Excavations made and backfilled.. | 19 | .. |
| Stop-cocks reset..... | 7 | 23 | Lamp-posts removed..... | 2 | .. |

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| Kind of Work. | First Ward. | Third Ward. | Kind of Work. | First Ward. | Third Ward. |
|---|---|---|---|---|---|
| Hydrants reset | 40 | 97 | Service lines located | 4 | .. |
| Gate boxes reset | 116 | 65 | Service lines repaired | 10 | .. |
| Hydrants removed | 24 | 4 | Taps located and shut off | 43 | .. |
| Pressures taken | 80 | 29 | Times regulating water pressures. | 88 | .. |
| Linear feet of water main laid | 130 | 400 | Samples of water taken | 31 | .. |
| Linear feet of water main lowered | 500 | .. | Dead ends blown out | 39 | .. |
| Private connections made | .. | 3 | Smith connections made | 12 | 1 |
| Meters set | 15 | 1 | New Stop-cocks set | 21 | 31 |
| Meters repaired | 8 | .. | New hydrants set | 29 | 9 |
| Times serving notices of water shut off | 65 | 40 | New gate boxes set | 26 | 16 |
| | | | Stop-cocks removed | 1 | .. |
| Times water was shut off and turned on | 109 | 23 | Stop-cock boxes removed | 1 | .. |
| | | | Connections made | .. | 2 |
| Leaks investigated | 73 | .. | Linear feet of water main yarned and caulked | .. | 1,950 |
| Valve boxes located and valves investigated | 25 | .. | | | |

Number of men at work at various times during the year at the several pumping stations and in the corporation yards.

Statement of Length of Water Mains in Use December 31, 1907, Lengths Added to December 31, 1908, and Total Lengths in Use December 31, 1908, with Number of Stop-cocks and Hydrants.

| Size of Mains and Stop-cocks. | Mains in Use December 31, 1907. | Additions to, December 31, 1908. | Total Mains in Use December 31, 1908. | Stop-cocks in Use December 31, 1907. | Additions to, December 31, 1908. | Total in Use December 31, 1908. |
|---|---|---|---|---|---|---|
| | Linear Feet. | Linear Feet. | Linear Feet. | | | |
| 24 inches | 17,500 | ..... | 17,500 | 6 | .... | 6 |
| 20 inches | 28,847 | ..... | 28,847 | 18 | .... | 18 |
| 16 inches | 25,470 | ..... | 25,470 | 18 | 1 | 19 |
| 14 inches | 7,002 | ..... | 7,002 | 5 | 4 | 9 |
| 12 inches | 146,482 | 18,420 | 164,902 | 323 | 91 | 414 |
| 10 inches | 31,789 | 190 | 31,979 | 44 | 7 | 51 |
| 8 inches | 150,123 | 33,170 | 183,293 | 326 | 86 | 412 |
| 6 inches | 290,959 | 3,584 | 294,543 | 931 | 202 | 1,133 |
| 4 inches | 64,013 | ..... | 64,013 | 54 | 1 | 55 |
| Total | 762,185 | 55,364 | 817,549 | 1,725 | 392 | 2,117 |

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| | |
|---|---|
| Hydrants in Use December 31, 1907 | 1,537 |
| Additions to December 31, 1908 | 212 |
| Total in use December 31, 1908 | 1,749 |

Work Completed Under Public Award During the Year 1908.

| Contractor. | Ward. | Date of Contract. | Date of Completion of Work. | Cost of Work. | Miles of Mains Laid. | Hydrants Set. | Gates Set. |
|---|---|---|---|---|---|---|---|
| J. P. Graham..... | 1 | Nov. 19, 1906 | Dec. 31, 1908 | $25,000 00 | 2.1 | 35 | 112 |
| J. P. Graham..... | 1 | Dec. 28, 1906 | Dec. 31, 1908 | 32,500 00 | 3.1 | 41 | 87 |
| J. P. Graham..... | 3 | Dec. 28, 1906 | Dec. 31, 1908 | 29,500 00 | 5.9 | 58 | 122 |

## MECHANICAL DIVISION.

### BOROUGHS OF MANHATTAN AND THE BRONX.

### Quarter Ending December 31, 1908.

### REPAIRS.

### Ninety-eighth Street Pumping Station.

During the past quarter repair work was done at this station to the following extent:

The heads on the condenser of No. 3 engine were removed and three hundred and twenty-five tubes were taken out and cleaned, twenty new tubes being used in resetting. All tubes were packed with new packing and tested. The independent air pump was overhauled and all gaskets and packing renewed. A new bushing was installed in the valve gear and the jacket piping was repaired on No. 3 engine. New Tobin bronze bolts were installed in the check valve on the discharge from No. 1 engine.

The angle iron on the flue uptake from boiler No. 1 was reinforced with flat iron and the nipples on boiler No. 2 were repaired.

All scales in the station were tested and adjusted.

### High Bridge Pumping Station.

A new sleeve was put in the steam chest of No. 1 pump and a new joint made on the air chamber. The old blow-off pipe on No. 2 boiler was removed and a new one fitted and installed. Broken teeth on the pinion of the coal hoisting engine were repaired temporarily with tap bolts, a new pinion having been ordered meanwhile. A crack on the suction side of No. 2 tower pump was patched, a full new set of water valves was installed in this pump and new joints made.

In No. 1 tower pump new springs were installed where necessary.

The tubes in No. 1 boiler were expanded, both boilers were cleaned internally and back connections cleaned each month, and the main flue under the boilers was thoroughly cleaned.

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Two new brasses were fitted to the air pump and a broken screw was drilled out and a new one fitted.

One Hundred and Seventy-ninth Street Pumping Station.

The repairs in the boiler room consisted of the construction of a new brick setting for boilers Nos. 1 and 2, including patching of back connection door frames, and repairs to boiler fronts, feed line, blow-off and jacket returns. In these boilers (1 and 2) nine leaky tubes were expanded and headed and leaky rivets in the dome heads were caulked. A new stay rod nut was used in repairing boiler No. 2.

Five new grate bars were fitted to the furnaces and the shaking apparatus was overhauled in the bank of boilers Nos. 1, 2, 3 and 4. These boilers had been opened twice during the quarter and scraped and cleaned. The automatic damper regulator was repaired, a new valve body, piston and cap packing being employed. A new four-inch spool piece was installed on the dome of No. 4 boiler and two eight-inch clamps were fitted over the steam pipe on boilers Nos. 1 and 2 to stop leaks. The feed pumps were repacked and the traps were ovehauled.

Boilers Nos. 5, 6, 7 and 8 were cleaned internally, the settings were pointed up and repaired and all clinkers were cut off the bridge and side walls. A surface drain to the sewer was cut in front of these boilers. The feed water pipe on boilers Nos. 5 and 6 was repaired with new nipples and fittings, all safety valves were tested and adjusted and new check valves were installed in the main feed pipes, the old globe valves being reground.

Similar work was done on boilers Nos. 9, 10 and 11, the interiors having been thoroughly cleaned and the combustion chambers and flues freed from ashes. The safety valves were removed and ground, tested and readjusted. A leak on the flange of the steam main between boilers Nos. 9 and 10 was repaired, a leaky blow-off valve in boiler No. 11 was renewed and in boiler No. 10, the tubes were expanded, bridge walls rebuilt and grate bars renewed. All steam gauges were tested and adjusted. A split tube was removed from the feed water heater and replaced with a new one. A leaky drain pipe on boiler No. 10 was repaired and a new joint was made on the saddle flange of this boiler. The interior feed pipe on boiler No. 9 was replaced with brass pipe.

On No. 1 engine the cylinder and receiver covering was repaired, one hundred and eighty-eight square feet of new lagging and fifteen pounds of brass straps being used. The condenser was cleaned and the valves, springs and studs on the water end examined, eighteen new valves and springs being used. A new joint was made in the bonnet of the four-inch auxiliary throttle valve and the intermediate valve gear and plunger rod packings were renewed. The governor belts were repaired and laced and the discharge main was scraped and painted.

On No. 2 engine the condenser was opened and cleaned, the attached air compressor plunger was packed and a new set of valves installed. The main throttle valve stem and all jacket valve stems were repacked. The water cylinders were opened and

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cleaned, ten new valves and springs being installed, the others being cleaned and examined. The governor belts were repaired and laced.

On No. 3 engine the intermediate pressure receiver was drilled and tapped and clearance holes drilled in the upper platforms to accommodate a one-inch pipe for the steam jacket. The high pressure piston rods and exhaust valve stems, and the plunger rods were repacked. The condenser was opened and cleaned and the valves were examined, eight new valves and springs and four new studs installed. Indicator cards were taken on this engine and the valves adjusted accordingly. The dash pot on the intermediate valve stem was cleaned and repaired. A leak on the jacket return pipe was repaired and a leaky valve replaced. Two hundred and eighty square feet of magnesia lagging was fitted to the cylinders and receivers and eleven pounds of brass straps used to secure it.

On No. 4 engine the dash pots on the steam valve rods were cleaned, the check valves adjusted and new springs inserted. The condenser was cleaned and the attached air compressor packed, a new set of valves being fitted to the suction and delivery; the intermediate and low pressure main piston rods were packed and the governor belts laced and repaired.

On No. 5 engine the jacket pipe connections and intermediate receiver heads were removed and the receiver tubes were repacked. The main and side throttle valves were ground and the stems repacked. Drain pipes were made to be fitted to each indicator cock but were not completely installed. The balancing tank plungers, compensating cylinders and the accumulator were repacked. The main valve stems were also repacked and a new set of valves installed in the Westinghouse and attached air compressors. The steam and water ends of the accumulator pump were repacked.

On No. 6 engine an entire new set of case hardened and ground steel motion pins and bronze bushings were fitted to the valve gear, the main and side throttle valves were ground, repaired and packed and the extension gears overhauled. The valve stems and bonnets were removed and three new friction collars fitted to the high pressure and four to the intermediate pressure valves. All valve stems and the low pressure piston rods were repacked. A new steel pin was fitted to the attached air pump rocker arm. A split tube was replaced in the condenser and all tubes screwed up and packed and the condenser tested. The balancing tank was opened and the interior scraped and cleaned, the water column being also taken down and cleaned and the plunger repacked. The compensating cylinders and accumulators were repacked.

A crack in the neck of the flange of the forty-eight-inch discharge main was repaired and braced and a cast iron split sleeve fitted and bolted on, the joints being caulked and the interior filled with cement grout. The discharge mains to the tower service were braced and shored.

A broken flange on the operating drum of the coal hoist was patched, a platform was erected to permit access to the guy cable fastenings on the dock, and the valve and piston rods of the hoisting engine were repacked and the bearings adjusted.

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The piston rod on the left side of the conveyor engine was adjusted and pinned to the cross-head, the crank pin and cross-head brasses were adjusted and all lost motion taken up on the bearings.

Jerome Avenue Pumping Station.

A new joint was made in the lower intermediate cylinder head of No. 2 engine and a new key fitted to the rock shaft of the attached air pump. A two-inch plug in the low high pressure cylinder head of No. 3 engine was removed and replaced and new valves and seats put in the air compressors.

The scales at this station were tested and adjusted and work was begun on putting up window guards in the coal shed.

DUTY REPORTS FOR QUARTER ENDING DECEMBER 31, 1908.

BOROUGHS OF MANHATTAN AND THE BRONX.

Ninety-eighth Street Pumping Station.

| | |
|---|---|
| Total U. S. gallons pumped | 1,413,876,188 |
| Average per day | 15,368,210 |
| Average head in feet | 87.8 |
| Million gallon feet | 124,190 |
| Million foot pounds | 1,034,500 |
| Total coal, pounds | 2,264,257 |
| Duty in foot-pounds per 100 pounds coal | 45,688,828 |

Cost of Pumping.

| | | |
|---|---|---|
| Payroll | $9,163 90 | |
| Fuel | 4,891 14 | |
| Supplies | 221 38 | |
| | $14,276 42 | |
| Repairs | 984 23 | |
| Total | $15,260 65 | |
| Cost per million gallon feet (without repairs) | $0 1148 | |
| Cost per million gallon feet (with repairs) | 1229 | |

High Bridge Pumping Station.

Tower Service—

| | |
|---|---|
| Total U. S. gallons pumped | 15,407,200 |
| Average per day | 167,469 |
| Average head in feet | 209.1 |
| Million gallon-feet | 3,221 |

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| | |
|---|---|
| Reservoir Service— | |
| Total U. S. gallons pumped | 521,855,247 |
| Average per day | 5,672,330 |
| Average head in feet | 116.5 |
| Million gallon-feet | 54,049 |
| Total for Station (All Engines)— | |
| Total U. S. gallons pumped | 537,263,447 |
| Average per day | 5,839,820 |
| Average head in feet | 119.2 |
| Million gallon-feet | 64,049 |
| Million foot pounds | 533,530 |
| Total coal, pounds | 1,168,160 |
| Duty in foot pounds per 100 pounds coal | 45,673,045 |

Cost of Pumping.

| | | |
|---|---|---|
| Payroll | $5,252 59 | |
| Fuel | 2,463 09 | |
| Supplies | 52 98 | |
| | $7,768 66 | |
| Repairs | 433 10 | |
| Total | $8,201 76 | |
| Cost per million gallon-feet (without repairs) | $0 1212 | |
| Cost per million gallon-feet (with repairs) | 1280 | |

One Hundred and Seventy-ninth Street Pumping Station.

| | |
|---|---|
| Tower Service— | |
| Total U. S. gallons pumped | 422,652,224 |
| Average per day | 4,594,045 |
| Average head in feet | 220.4 |
| Million gallon-feet | 93,184 |
| Reservoir Service— | |
| Total U. S. gallons pumped | 2,981,402,954 |
| Average per day | 32,406,553 |
| Average head in feet | 116.6 |
| Million gallon-feet | 347,841 |

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| | |
|---|---|
| Total for Station (All Engines)— | |
| Total U. S. gallons pumped | 3,404,055,178 |
| Average per day | 37,000,600 |
| Average head in feet | 129.5 |
| Million gallon-feet | 441,025 |
| Million foot pounds | 3,673,736 |
| Total coal, pounds | 4,894,158 |
| Duty in foot pounds per 100 pounds coal | 75,063,700 |

Cost of Pumping.

| | | |
|---|---|---|
| Payroll | $13,883 72 | |
| Fuel | 10,040 89 | |
| Supplies | 567 50 | |
| | $24,492 11 | |
| Repairs | 4,822 31 | |
| Total | $29,314 42 | |
| Cost per million gallon-feet (without repairs) | $0 0555 | |
| Cost per million gallon-feet (with repairs) | 0664 | |

Jerome Avenue Pumping Station.

| | |
|---|---|
| Total U. S. Gallons pumped | 692,936,719 |
| Average per day | 7,531,920 |
| Average head in feet | 178.11 |
| Million gallon feet | 123,434 |
| Million foot pounds | 1,028,206 |
| Total coal, pounds | 1,604,760 |
| Duty in foot-pounds per 100 pounds coal | 64,072,253 |

Cost of Pumping.

| | | |
|---|---|---|
| Payroll | $6,087 47 | |
| Fuel | 4,029 92 | |
| Supplies | 271 01 | |
| | $10,388 40 | |
| Repairs | 650 18 | |
| Total | $11,038 58 | |
| Cost per million gallon-feet (without repairs) | $0 0841 | |
| Cost per million gallon-feet (with repairs) | 0894 | |

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PUMPING STATIONS, BOROUGHS OF MANHATTAN AND THE BRONX—CONDITION, EXTENSION AND IMPROVEMENT—RECOMMENDATIONS.

The extensive repairs and replacing of the old apparatus at the pumping stations by new installations have continued during the year just closed and are gradually putting these stations on a more safe, reliable and economical running basis. The work which has been done and which will be done in the near future will be governed by the conditions which will arise when the new supply of water from the Catskills is available.

Ninety-eighth Street Pumping Station.

In this station the engines are in a good state of repair and developing their normal capacity with an efficiency that is high for this type of engine, and very little difficulty has been encountered in maintaining the normal pressure with two pumping engines running and one held in reserve.

The work of improving this station in accordance with the general plan outlined in the resolution authorizing bonds for the extension and improvement of the various pumping stations in the Boroughs of Manhattan and The Bronx is well under way. On March 11 the Sinking Fund Commission duly authorized the transfer to this Department of the boilers and parts of the other apparatus at the lighting and incinerating plant located at the Delancey street end of the Williamsburg Bridge. Plans were immediately prepared for dismantling and removing the two batteries of two horizontal return tubular boilers each, and their appurtenances, from the boiler room of this pumping station and replacing them by the two Sterling water tube boilers, and their appurtenances, from the incinerating plant at the Delancey street end of the Williamsburg Bridge and installing therewith entire new main and auxiliary steam piping and other appurtenances complete, which will thus make the boiler plant at this station absolutely reliable for the work which it has to do. The contract for this work was duly advertised and was awarded to the lowest bidder, Frank McSwegan & Son, at $10,290. This firm was notified to begin work on November 9, 1908, and the work of installation is now progressing.

The roof of the coal bunker, with the drains therefrom, is now undergoing extensive permanent repairs, and repairs are also being made to the roof in the standpipe tower. Temporary repairs are being made to the main roof over the engine room and boiler room.

Plans and specifications for the replacing of the present roof of the engine room and boiler room with a roof of fireproof construction, in accordance with the recommendations of the Board of Fire Underwriters, are practically completed.

Plans and specifications are practically completed for the replacing of the two present antiquated low duty pumps whose capacity is but 7,500,000 gallons each, by two pumps of modern type, whose capacity will be approximately 18,000,000 each. Included in this work will be the replacing of the present discharge from the station by

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a new discharge, and also installing an additional discharge so as to entirely prevent the annoyance of having to shut this station down on account of leaks or breaks in the single discharge, which has at times been the case. With the installation of these two pumps, it will be possible to make considerable extension to the area receiving pump service from this station.

Plans and specifications are also in preparation for increasing the suction supply to this station.

One Hundred and Seventy-ninth Street Pumping Station.

At this pumping station the comprehensive repairs on the engines have been continued during the year and the engines are now in a very high state of efficiency.

The plans and specifications for supplanting the four horizontal return tubular boilers, Nos. 1, 2, 3 and 4, by four modern water tube boilers of 270-horse-power each, to work in conjunction with economizer and feed water heater and being complete with new modern steam lines, were duly completed and advertised. The contract for this work was awarded to the Oil City Boiler Works for the sum of $41,900, and they were notified to begin work on October 15, 1908. This work is progressing very satisfactorily at the shops and the contractor is now ready to begin shipment of the greater part of the boilers and piping. The installation as planned will make a very compact steam plant, the main steam line being considerably shorter than in the present installation, and the heat saving devices included in the installation will result in great economy in steam consumption.

The limited amount of money provided in the Budget for repairs and renewals did not permit of making any extensive repairs on the coal handling machinery and only such repairs were made on it as became absolutely necessary from time to time. It is, however, advisable that this apparatus receive a thorough overhauling at an early date, and when once put in good working condition it will be able to take care of the station for a number of years to come.

The work of repairing the roof of the tower and standpipe and of the brick tower at this station has been ordered done.

Plans and specifications are under way to install separate suction and discharge lines from both the high service and tower service at this station and to strengthen the present discharge line from the engines on said services.

Plans are also under way to increase the pumping capacity on the tower service at this station by the installation of a new engine having a capacity of from eight to ten million gallons per day, and pumping into the tower high service and so arranged that it will be available for use in pumping on the reservoir high service if necessary. By this means, if an additional main be laid across High Bridge, high sections of The Bronx near the Harlem River may be supplied from this station, and in addition thereto, would insure a partial supply in case of a breakdown at the Jerome Avenue Station.

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I therefore recommend the laying of an additional main from the One Hundred and Seventy-ninth Street Pumping Station to connect at Aqueduct avenue with the supply mains from the high service at Jerome Avenue Pumping Station, the object of which will be not only to add to the supply available for The Bronx but to provide at least partially against interruption of the service in that Borough in case of the breakdown of the engines at the Jerome Avenue Station.

### High Bridge Pumping Station.

The High Bridge Pumping Station, which was used for several years mainly as a reserve station, water being pumped only during one watch of the day, banked fires being maintained during the rest of the time to meet any possible emergency that might arise due to breakdown at either the One Hundred and Seventy-ninth Street Pumping Station or the Ninety-eighth Street Pumping Station, was, during the past year, put on a twenty-four-hour running basis, in order to relieve the other pumping stations of excessive pumping during the time that the contemplated repairs and improvements would be in progress.

Thus, during the current year, the average daily pumpage on the reservoir service was approximately 4,350,000 gallons and on the tower service approximately 133,000 gallons.

The contemplated repairs to the roof at this station are now under way.

### Jerome Avenue Pumping Station.

At the Jerome Avenue Pumping Station during the current year the average daily pumpage was 8,831,000 gallons.

As this station contains at present but two pumping engines of approximately 10,000,000 gallons capacity and as the daily consumption approximates the capacity of one of these units it has been deemed advisable to provide for reserve during the time that the second unit may be required to be in service. This reserve pumping capacity will be provided by the installation of two 12,500,000-gallon steam turbo-turbine pumps with two 225-horse-power water tube boilers and all accessories and appurtenances to be installed in this pumping station at an early date by the Board of Water Supply of The City of New York.

When the question came up to this Department as to the advisability of transferring the control of the Kensico Reservoir from this Department to the Board of Water Supply, during the time that the new Kensico Reservoir will be under construction, in order to obviate the question of divided authority and responsibility, I suggested and recommended that in order to provide for furnishing water to the Williamsbridge service during such times as it would be necessary to temporarily cut off the supply from the Kensico Reservoir, that an auxiliary pumping plant of the above type be installed in our Jerome Avenue Pumping Station, by and at the cost and expense of the Board of Water Supply, thus guaranteeing a constant supply on the

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Williamsbridge Reservoir service. This suggestion met with the approval of the Board of Water Supply and they are preparing plans and specifications for the installation of the above named plant. The preliminary plans prepared by them in accordance with my suggestions have already met my approval and I expect in the near future to receive for approval copies of the final plans and specifications.

When the above plant is completely installed, the Department will be in a position to operate both of the present engines and have the new plant as a reserve in case of a breakdown, thus eliminating the question of further extensions of the pumping service at this station for a considerable time to come.

The water end of the No. 3 pumping engine which developed a crack in the valve deck more than two years ago does not show any further signs of weakening, but owing to the inability to determine how long this casting may remain intact under present working conditions it is recommended that as soon as authorization is given therefor a new water end be furnished and delivered to meet any possible emergency that may arise.

As soon as the contemplated improvements by the Board of Water Supply are under way and the openings in the floor are definitely established, the terra cotta floor tiling on the remainder of the flooring at this station, which is badly buckled, will be taken up and relaid or replaced by new floor cover.

At each of the pumping stations in the Boroughs of Manhattan and The Bronx plans are under way to divide or rearrange the coal bunkers so as to facilitate the proper handling and weighing of the coal received and consumed.

## BOROUGH OF QUEENS.

### Reports for the Quarter Ending December 31, 1908.

### Pumping Station No. 1.

A fire door 18 by 24 inches was furnished in October, 1908. This was placed in the flue of chimney to permit access for cleaning. The opening was cut in flue by Department Mason and door set during latter part of November. The damper regulator was overhauled and repaired, same requiring new diaphragm and minor parts, such as valve stem, body, etc.

No. 1 boiler was cleaned and fire box and ash pit repaired as also top brickwork of drum of same. A new vise bench was erected in boiler room. Boiler feed pump was repaired and put in order; work was done by Sweeney & Gray, and involved scraping valves and taking up lost motion.

No. 1 pump was repaired, same requiring new piston rod, new valves, new gaskets, pump being all dismantled.

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Pumping Station No. 2.

Boiler was cleaned during October. Valve guard twice repaired. Pipes outside of building were covered with asbestos during November for protection from the cold. Boiler was cleaned November 14 and 15. At this time the shell was found to be pitted, and a hole was drilled and tapped in back head of boiler and thickness measured; the pump was shut down and the steam pressure was reduced thereafter to safe limit, pending decision of Chief Engineer.

During November the condenser was raised to permit access to pump cylinders, same necessitating some changes in the piping together with special fittings.

Pumping Station No. 3.

Engine counter on No. 1 pump was repaired and tested, damper regulator was repaired, receiving new diaphragm, valve rod and body, also repacking. Snow feed pump was overhauled and repaired, same requiring some new parts such as rock shaft, rocker arm and levers, bushing rings, valves, valve seats, springs, stems, rods, plungers, sleeves, binders, brass piston rod, new link. New bonnet for straightway valve on header of boiler No. 2. This involved making sketch and sending same to Chicago to have casting made. Lubricators were repaired, also minor repairs to tools.

All main steam line valves were repaired and packed and new gaskets placed on main steam line to snow pump.

Bayside Pumping Station.

Boilers were cleaned during October and December. The Blake pump developed a leak after its overhauling during the last quarter; this was repaired by Department labor, work requiring one day.

The pipe to steam heating jacket was repaired, as also the valve on primer pipe, water end.

Flushing Pumping Station.

At Flushing the only repairs were made on tools, such as fire hoes.

One valve was repaired. Boilers were cleaned during the quarter and a few broken window lights renewed.

Whitestone Pumping Station.

The boilers were cleaned at Whitestone during the quarter, but no repairs were undertaken.

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# DUTY REPORTS FOR THE QUARTER ENDING DECEMBER 31, 1908.

## BOROUGH OF QUEENS.

### First Ward.

### Pumping Station No. 1.

| | |
|---|---|
| Total United States gallons pumped | 57,145,012 |
| Average per day | 627,967 |
| Average head in feet | 180.21 |
| Million gallon feet | 10,298.1 |
| Million foot pounds | 85,783.1 |
| Total coal, pounds | 497,400 |
| Duty in foot pounds per 100 pounds coal | 17,246,139 |

### Cost of Pumping.

| | | |
|---|---|---|
| Payroll | | $3,073 50 |
| Fuel | | 945 06 |
| Supplies | | 87 79 |
| | | $4,106 35 |
| Repairs | | 271 71 |
| Total | | $4,378 06 |
| Cost per million gallon feet (without repairs) | | $0.3987 |
| Cost per million gallon feet (with repairs) | | 0.4325 |

### Pumping Station No. 2.

On October 27, 1908, the Superintendent of Steam Boiler Inspection informed us that the boilers could not be permitted to carry more than 50 pounds steam pressure, and as this is not sufficient to operate the pumps against the normal water pressure at this station, the latter had to be put out of service, except at such times as the pressure dropped below the usual standard, when the plant was started and run until normal pressure was reached.

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## Pumping Station No. 3.

| | |
|---|---|
| Total United States gallons pumped | 74,725,721 |
| Average per day | 812,236 |
| Average head, in feet | 154.52 |
| Million gallon feet | 11,546.6 |
| Million foot pounds | 96,183.3 |
| Total coal, pounds | 345,855 |
| Duty in foot pounds per 100 pounds coal | 24,891,190 |

## Cost of Pumping.

| | | |
|---|---|---|
| Payroll | | $2,533 00 |
| Fuel | | 657 13 |
| Supplies | | 57 86 |
| | | $3,247 99 |
| Repairs | | 55 33 |
| Total | | $3,303 32 |
| Cost per million gallon feet (without repairs) | | $0.2813 |
| Cost per million gallon feet (with repairs) | | 0.2935 |

## Flushing Pumping Station.

| | |
|---|---|
| Total United States gallons pumped | 154,591,676 |
| Average per day | 1,680,344 |
| Average head, in feet | 217.92 |
| Million gallon feet | 33,688.6 |
| Million foot pounds | 280,626.3 |
| Total coal, pounds | 1,327,500 |
| Duty in foot pounds per 100 pounds coal | 21,139,462 |

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Cost of Pumping.

| | | |
|---|---|---|
| Payroll | $3,089 50 | |
| Fuel | 2,522 25 | |
| Supplies | 215 28 | |
| | $5,827 03 | |
| Repairs | 12 33 | |
| Total | $5,839 36 | |
| Cost per million gallon feet (without repairs) | $0.1729 | |
| Cost per million gallon feet (with repairs) | 0.1733 | |

Bayside Pumping Station.

| | |
|---|---|
| Total United States gallons pumped | 143,071,699 |
| Average per day | 1,555,127 |
| Average head, in feet | 181.59 |
| Million gallon feet | 25,980.3 |
| Million foot pounds | 216,416.6 |
| Total coal, pounds | 558,100 |
| Duty in foot pounds per 100 pounds coal | 38,777,396 |

Cost of Pumping.

| | | |
|---|---|---|
| Payroll | $2,722 00 | |
| Fuel | 1,060 49 | |
| Supplies | 53 29 | |
| | $3,835 78 | |
| Repairs | 12 33 | |
| Total | $3,848 11 | |
| Cost per million gallon feet (without repairs) | $0.1476 | |
| Cost per million gallon feet (with repairs) | 0.1490 | |

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Whitestone Pumping Station.

| | |
|---|---|
| Total United States gallons pumped | 35,959,330 |
| Average per day | 390,862 |
| Average head, in feet | 179.67 |
| Million gallon feet | 6,460.8 |
| Million foot pounds | 53,818.4 |
| Total coal, pounds | 232,345 |
| Duty in foot pounds per 100 pounds coal | 22,641,527 |

Cost of Pumping.

| | | |
|---|---|---|
| Payroll | | $2,314 00 |
| Fuel | | 441 45 |
| Supplies | | 156 18 |
| | | $2,911 63 |
| Repairs | | 12 33 |
| Total | | $2,923 96 |
| Cost per million gallon feet (without repairs) | | $0.4506 |
| Cost per million gallon feet (with repairs) | | 0.4526 |

PUMPING STATIONS, BOROUGH OF QUEENS—CONDITION, EXTENSION AND IMPROVEMENT—RECOMMENDATIONS.

Under the head of "Supply," a pretty full description has been given of existing conditions and relative cost of operation of our various pumping stations.

The plans, specifications and estimates to carry out the utilization of the waters of Oakland Lake, by filtration, to which reference was made in last year's report, were completed as far back as 1907, but the appropriation for the work, owing to failure at some of the stages in the Board of Aldermen in 1907, was not finally granted until February 11, 1908. The plans for the condemnation of land were immediately forwarded (February 19) to the Board of Estimate and approved by the latter body on October 29, 1908.

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As the plans for filtering the waters of Oakland Lake, estimates, etc., are not only completed but have actually been printed, they can and should be advertised as soon as the City obtains possession of the land.

In furthering this work, two large test wells of what is known as the "stove-pipe" type, used in California, are to be driven to a depth of about 500 feet, in order to ascertain the nature of the underlying soil and enable us to properly design additional wells both at Bayside and at Flushing. These wells should be driven to a depth of from 400 to 500 feet, according to circumstances, and we will utilize for that purpose the driving apparatus obtained by the Board of Water Supply for their investigations, the use of which has been kindly allowed us by the Board, and it will be operated by the men who have done similar work for the Board of Water Supply.

The well at Bayside is well advanced already and as soon as completed a second one will be driven at Flushing on the old right of way of the Long Island Railroad, the consent of the latter corporation having been obtained.

The plans and specifications for the enlargement of the pumping station and the installation of the requisite additional pumping plants, will be soon completed so that the contract can be advertised as early as possible.

We are preparing plans and specifications to lay the necessary mains to deliver water from Station No. 3 of the Citizens' Water Company, in case it is decided to accept the proposition of that company to deliver water from said Station No. 3, which the company would connect with the Douglaston Station if the City would lay the necessary mains between Station No. 3 and Long Island City. Reference to this proposition was made in my report of November 27, 1908, previously quoted.

As a shortage of water in Long Island City may be apprehended next summer, under normal conditions it will be important to determine which of the various methods suggested is to be adopted to increase the supply.

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BOROUGH OF MANHATTAN.

## Pumping Record, Ninety-eighth Street Pumping Station.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 1,516,023,207 | 87.46 | 2,413,903 | 1,077.63 | 1,590 | *.... | $5 43 |
| April, May, June | 1,506,130,120 | 87.39 | 2,199,601 | 722.60<br>258.90 | 1,461 | †.... | 5 43<br>4 84 |
| July, August, September | 1,372,287,817 | 87.58 | 2,060,755 | 919.97 | 1,502 | ‡.... | 4 84 |
| October, November, December | 1,413,876,188 | 87.80 | 2,264,257 | 1,010.30 | 1,601 | ‡.... | 4 84 |
| Total.. | 5,808,317,332 | ..... | 8,938,516 | 3,989.40 | .... | .... | .... |
| Average..... | ..... | 87.56 | ..... | ..... | 1,538 | .... | $5 11 |
| Average per day. | 15,869,719 | ..... | 24,422 | 10.89 | .... | .... | .... |

* Anthracite, egg size. † Egg, broken. ‡ Broken.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. | | | | |
|---|---|---|---|---|---|---|
| | | Cost of Pumping, Based on | | | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
| | | Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | | |
| January, February, March | 44,928,170 | $5,865 94 | $998 06 | $9,201 14 | $16,065 14 | $0 1212 |
| April, May, June | 49,843,221 | 5,195 02 | 907 73 | 8,918 11 | 15,020 86 | 0 1130 |
| July, August, September | 48,585,182 | 4,460 30 | 1,057 79 | 9,016 63 | 14,534 72 | 0 1209 |
| October, November, December | 45,688,828 | 4,891 13 | 1,205 61 | 9,163 90 | 15,260 65 | 0 1229 |
| Total..... | ..... | $20,412 40 | $4,169 19 | $36,299 78 | $60,881 37 | ..... |
| Average..... | 47,397,181 | ..... | ..... | ..... | ..... | $0 1198 |
| Average per day..... | ..... | $55 77 | $11 39 | $99 18 | $166 34 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, High Bridge Pumping Station.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 93,524,276 | 100.84 | 375,100 | 167.45 | 4,010 | *.... | $5 39 |
| April, May, June | 501,850,364 | 117.60 | 1,076,947 | 253.90<br>126.60 | 2,146 | †.... | 5 39<br>4 72 |
| July, August, September | 503,899,696 | 119.69 | 1,172,740 | 523.50 | 2,327 | ‡.... | 4 72 |
| October, November, December | 537,263,447 | 119.20 | 1,168,160 | 521.50 | 2,174 | ‡.... | 4 72 |
| Total.. | 1,636,536,783 | ..... | 3,792,947 | 1,592.95 | .... | .... | .... |
| Average..... | ..... | 118.43 | ..... | ..... | 2,317 | .... | $4 91 |
| Average per day. | 4,471,412 | ..... | 10,363 | 4.36 | .... | .... | .... |

* Anthracite, egg size. † Egg, broken. ‡ Broken.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on: Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 32,927,437 | $907 66 | $1,505 44 | $1,514 36 | $3,927 46 | $0 4164 |
| April, May, June | 45,651,736 | 1,970 89 | 243 04 | 3,877 20 | 6,091 13 | 0 1032 |
| July, August, September | 42,839,674 | 2,489 32 | 456 21 | 3,476 53 | 6,422 06 | 0 1064 |
| October, November, December | 45,673,045 | 2,463 09 | 486 08 | 5,252 59 | 8,201 76 | 0 1280 |
| Total..... | ..... | $7,830 96 | $2,690 77 | $14,120 68 | $24,642 41 | ..... |
| Average..... | 42,337,475 | ..... | ..... | ..... | ..... | $0 1271 |
| Average per day..... | ..... | $21 40 | $7 35 | $38 58 | $67 33 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, One Hundred and Seventy-ninth Street Pumping Station.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 3,920,230,480 | 106.4 | 5,317,212 | 2,373.7 | 1,356 | *.... | $5 22 |
| April, May, June | 3,433,478,912 | 127.4 | 4,436,971 | 1,289.1<br>691.6 | 1,291 | †.... | 5 22<br>4 59 |
| July, August, September | 3,257,608,345 | 131.3 | 4,557,843 | 2,035.3 | 1,398 | ‡.... | 4 59 |
| October, November, December | 3,404,055,178 | 129.5 | 4,894,158 | 2,184.7 | 1,437 | ‡.... | 4 59 |
| Total.. | 14,015,372,915 | ..... | 19,206,184 | 8,574.4 | .... | .... | .... |
| Average..... | ..... | 128.9 | ..... | ..... | 1,370 | .... | $4 87 |
| Average per day. | 38,293,360 | ..... | 52,476 | 23.4 | .... | .... | .... |

* Anthracite, egg size. † Egg, broken. ‡ Broken.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 78,431,102 | $12,407 60 | $8,587 50 | $14,599 50 | $35,594 60 | $0 0711 |
| April, May, June | 82,102,565 | 9,942 04 | 3,570 90 | 13,845 13 | 27,358 07 | 0 0625 |
| July, August, September | 78,203,943 | 9,352 53 | 6,057 19 | 14,104 44 | 29,514 16 | 0 0828 |
| October, November, December | 75,063,700 | 10,040 59 | 5,389 81 | 13,883 72 | 29,314 42 | 0 0664 |
| Total..... | ..... | $41,743 06 | $23,605 40 | $56,432 79 | $121,781 25 | ..... |
| Average..... | 78,364,791 | ..... | ..... | ..... | ..... | $0 0674 |
| Average per day..... | ..... | $114 05 | $64 49 | $154 18 | $332 72 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## BOROUGH OF THE BRONX.

### Pumping Record, Jerome Avenue Pumping Station.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 882,912,161 | 178.26 | 1,833,270 | 818.42 | 2,076 | *.... | $6 29 |
| April, May, June | 900,827,587 | 178.20 | 1,829,901 | 529.42<br>287.26 | 2,031 | †.... | 6 29<br>5 61 |
| July, August, September | 755,583,511 | 180.07 | 1,757,230 | 784.47 | 2,321 | ‡.... | 5 61 |
| October, November, December | 692,936,719 | 178.11 | 1,604,760 | 716.50 | 2,316 | ‡.... | 5 61 |
| Total.. | 3,232,259,978 | ..... | 7,025,161 | 3,136.07 | .... | .... | .... |
| Average..... | ..... | 178.78 | ..... | ..... | 2,173 | .... | $5 91 |
| Average per day. | 8,831,311 | ..... | 19,194 | 8.57 | .... | .... | .... |

* Anthracite, egg size. † Egg, broken. ‡ Broken.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 71,512,598 | $5,159 11 | $1,699 83 | $5,920 28 | $12,779 22 | $0 0820 |
| April, May, June | 72,619,994 | 4,932 72 | 508 35 | 5,732 73 | 11,173 80 | 0 0696 |
| July, August, September | 64,721,863 | 4,414 23 | 4,075 22 | 6,218 38 | 14,707 83 | 0 0836 |
| October, November, December | 64,072,253 | 4,029 92 | 921 19 | 6,087 47 | 11,038 58 | 0 0894 |
| Total..... | ..... | $18,535 98 | $7,204 59 | $23,958 86 | $49,699 43 | ..... |
| Average..... | 68,402,859 | ..... | ..... | ..... | ..... | $0 0860 |
| Average per day..... | ..... | $50 64 | $19 67 | $65 46 | $135 77 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## BOROUGH OF QUEENS.

### Pumping Record, Pumping Station No. 1.

| 1908. | Coal Used, Duty, etc. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 62,762,285 | 170.41 | 448,535 | 65.84<br>134.39 | 6,619 | *.... | $4 70<br>4 19 |
| April, May, June | 65,755,198 | 169.70 | 494,010 | 220.42 | 7,512 | *.... | 4 19 |
| July, August, September | 57,456,499 | 182.15 | 483,005 | 215.60 | 8,406 | *.... | 4 19 |
| October, November, December | 57,145,012 | 180.21 | 497,400 | 222.05 | 6,704 | *.... | 4 19 |
| Total.. | 243,108,994 | ..... | 1,922,950 | 858.30 | .... | .... | .... |
| Average..... | ..... | 175.13 | ..... | ..... | 7,909 | .... | $4 26 |
| Average per day. | 664,222 | ..... | 5,253 | 2.34 | .... | .... | .... |

* Anthracite, pea size.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on: Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 19,818,833 | $872 54 | $139 72 | $2,360 50 | $3,372 76 | $0 3153 |
| April, May, June | 18,816,218 | 928 06 | 74 10 | 2,295 50 | 3,297 66 | 0 2955 |
| July, August, September | 18,041,341 | 912 92 | 241 29 | 2,369 06 | 3,523 27 | 0 3366 |
| October, November, December | 17,246,139 | 945 06 | 359 50 | 3,073 50 | 4,378 06 | 0 4325 |
| Total..... | ..... | $3,658 58 | $814 61 | $10,098 56 | $14,571 75 | ..... |
| Average..... | 18,461,634 | ..... | ..... | ..... | ..... | $0 3419 |
| Average per day..... | ..... | $9 99 | $2 22 | $27 59 | $39 81 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, Pumping Station No. 2.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 51,073,137 | 151.64 | 407,422 | 126.41<br>55.45 | 7,977 | *.... | $4 70<br>4 19 |
| April, May, June | 44,155,502 | 152.84 | 298,134 | 132.90 | 6,752 | *.... | 4 19 |
| July, August, September | 46,035,837 | 138.85 | 290,424 | 129.60 | 6,308 | *.... | 4 19 |
| †October, †November, †December | ..... | ..... | ..... | ..... | .... | *.... | .... |
| Total.. | 141,264,476 | ..... | 995,980 | 444.36 | .... | .... | .... |
| Average..... | ..... | 147.85 | ..... | ..... | 7,064 | .... | $4 39 |
| Average per day. | ‡515,563 | ..... | 3,642 | 1.62 | .... | .... | .... |

* Anthracite, pea size. † Not in service. ‡ For 274 days.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on: Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 15,835,548 | $828 69 | $98 86 | $2,355 00 | $3,282 55 | $0 4238 |
| April, May, June | 18,856,950 | 561 35 | 89 60 | 2,114 50 | 2,765 45 | 0 4097 |
| July, August, September | 18,414,335 | 562 04 | 109 57 | 2,296 56 | 2,968 17 | 0 4644 |
| October, November, December | ..... | ..... | ..... | ..... | ..... | ..... |
| Total..... | ..... | $1,952 08 | $298 03 | $6,766 06 | $9,016 17 | ..... |
| Average..... | 17,468,322 | ..... | ..... | ..... | ..... | $0 4316 |
| Average per day..... | ..... | $7 12 | $1 09 | $24 69 | $32 90 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, Pumping Station No. 3.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 61,682,553 | 139.37 | 333,444 | 49.66<br>99.19 | 5,406 | *.... | $4 23<br>4 60 |
| April, May, June | 72,396,928 | 139.51 | 336,030 | 150.00 | 4,641 | *.... | 4 19 |
| July, August, September | 71,430,123 | 150.84 | 342,635 | 152.90 | 4,796 | *.... | 4 19 |
| October, November, December | 74,725,721 | 154.52 | 345,855 | 154.30 | 4,628 | *.... | 4 19 |
| Total.. | 280,235,325 | ..... | 1,357,964 | 606.05 | .... | .... | .... |
| Average..... | ..... | 146.37 | ..... | ..... | 4,845 | .... | $4 29 |
| Average per day. | 765,670 | ..... | 3,710 | 1.65 | .... | .... | .... |

* Anthracite, pea size.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on: Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 21,476,469 | $669 09 | $112 88 | $2,336 20 | $3,118 17 | $0 3626 |
| April, May, June | 25,037,347 | 633 00 | 97 45 | 2,385 50 | 3,115 95 | 0 3085 |
| July, August, September | 26,143,425 | 641 01 | 116 99 | 2,508 06 | 3,266 06 | 0 3031 |
| October, November, December | 24,891,190 | 657 13 | 113 19 | 2,533 00 | 3,303 32 | 0 2935 |
| Total..... | ..... | $2,600 23 | $440 51 | $9,762 76 | $12,803 50 | ..... |
| Average..... | 25,161,122 | ..... | ..... | ..... | ..... | $0 3121 |
| Average per day..... | ..... | $7 10 | $1 20 | $26 67 | $34 98 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, Flushing Pumping Station.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 155,986,810 | 171.01 | 1,264,100 | 185.71<br>278.62 | 8,103 | *.... | $4 70<br>4 19 |
| April, May, June | 153,976,631 | 227.99 | 1,356,430 | 605.60 | 8,809 | *.... | 4 19 |
| July, August, September | 163,916,198 | 215.66 | 1,370,105 | 611.65 | 8,358 | *.... | 4 19 |
| October, November, December | 154,591,676 | 217.92 | 1,327,500 | 592.63 | 8,587 | *.... | 4 19 |
| Total.. | 628,471,315 | ..... | 5,318,135 | 2,274.11 | .... | .... | .... |
| Average..... | ..... | 208.15 | ..... | ..... | 8,462 | .... | $4 26 |
| Average per day. | 1,717,134 | ..... | 1,453 | 6.21 | .... | .... | .... |

* Anthracite, pea size.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on: Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 17,578,198 | $2,037 39 | $197 80 | $2,866 50 | $5,101 69 | $0 1912 |
| April, May, June | 17,923,779 | 2,541 55 | 168 68 | 3,528 00 | 6,238 23 | 0 1777 |
| July, August, September | 21,492,286 | 2,603 20 | 47 66 | 2,665 56 | 5,316 42 | 0 1503 |
| October, November, December | 21,139,462 | 2,522 25 | 227 61 | 3,089 50 | 5,839 36 | 0 1733 |
| Total..... | ..... | $9,704 39 | $641 75 | $12,149 56 | $22,495 70 | ..... |
| Average..... | 20,614,801 | ..... | ..... | ..... | ..... | $0 1720 |
| Average per day..... | ..... | $26 51 | $1 75 | $33 19 | $61 46 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, Bayside Pumping Station.

| 1908. | Coal Used, Duty, etc. U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
|---|---|---|---|---|---|---|---|
| January..... February..... March..... | 110,508,436 | 196.21 | 548,800 | 84.33 160.58 | 4,966 | *.... | $4 70 4 19 |
| April..... May..... June..... | 114,183,638 | 193.39 | 532,650 | 237.66 | 4,665 | *.... | 4 19 |
| July..... August..... September..... | 137,487,039 | 178.21 | 537,100 | 239.78 | 3,909 | *.... | 4 19 |
| October..... November..... December..... | 143,071,699 | 181.59 | 558,100 | 249.15 | 3,909 | *.... | 4 19 |
| Total.. | 505,250,812 | ..... | 2,176,650 | 971.50 | .... | .... | .... |
| Average..... | ..... | 186.53 | ..... | ..... | 4,308 | .... | $4 27 |
| Average per day. | 1,380,467 | ..... | 5,947 | 2.65 | .... | .... | .... |

* Anthracite, pea size.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January..... February..... March..... | 32,912,718 | $1,079 18 | $159 56 | $2,688 00 | $3,936 74 | $0 1811 |
| April..... May..... June..... | 34,533,558 | 990 30 | 110 11 | 2,668 50 | 3,768 91 | 0 1706 |
| July..... August..... September..... | 38,000,005 | 1,020 49 | 63 44 | 2,654 06 | 3,737 99 | 0 1525 |
| October..... November..... December..... | 38,777,396 | 1,060 49 | 65 62 | 2,722 00 | 3,848 11 | 0 1490 |
| Total..... | ..... | $4,150 46 | $398 73 | $10,732 56 | $15,281 75 | ..... |
| Average..... | 36,068,224 | ..... | ..... | ..... | ..... | $0 1621 |
| Average per day..... | ..... | $11 34 | $1 09 | $29 32 | $41 75 | ..... |

Interest and Sinking Fund not included in cost of pumping.

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## Pumping Record, Whitestone Pumping Station.

| 1908. | Coal Used, Duty, etc. | | | | | | |
|---|---|---|---|---|---|---|---|
| | U. S. Gallons Pumped. | Average Total Dynamic Lift in Feet. | Total Coal or Equivalent. In Pounds. | Total Coal or Equivalent. In Gross Tons. | Pounds of Coal Used Per Million Gallons. | Quality of Coal. | Cost of Coal Per Gross Ton. |
| January, February, March | 36,264,822 | 169.73 | 250,635 | 37.09 / 74.78 | 6,911 | * | $4 70 / 4 19 |
| April, May, June | 38,642,223 | 169.69 | 232,325 | 103.60 | 6,012 | * | 4 19 |
| July, August, September | 41,273,086 | 165.90 | 228,196 | 101.87 | 5,529 | * | 4 19 |
| October, November, December | 35,959,330 | 179.67 | 232,345 | 103.73 | 6,461 | * | 4 19 |
| Total.. | 152,539,461 | ..... | 943,501 | 421.07 | .... | .... | .... |
| Average..... | ..... | 170.51 | ..... | ..... | 6,185 | .... | $4 28 |
| Average per day. | 416,774 | ..... | 2,577 | 1.15 | .... | .... | .... |

* Anthracite, pea size.

| 1908. | Average Duty in Foot Pounds Per 100 Pounds of Coal. | Cost of Pumpage. Cost of Pumping, Based on: Cost of Coal Used. | Materials, Supplies and Repairs. | Salaries. | Total Cost of Pumping. | Cost of Pumping One Million Gallons Against One Foot-Head. |
|---|---|---|---|---|---|---|
| January, February, March | 20,458,036 | $489 81 | $93 57 | $2,158 00 | $2,741 38 | $0 4450 |
| April, May, June | 28,224,943 | 438 58 | 26 74 | 2,448 00 | 2,913 32 | 0 4443 |
| July, August, September | 24,994,836 | 433 57 | 49 17 | 2,487 56 | 2,970 30 | 0 4337 |
| October, November, December | 22,641,527 | 441 45 | 168 51 | 2,314 00 | 2,923 96 | 0 4526 |
| Total..... | ..... | $1,803 41 | $337 99 | $9,407 56 | $11,548 96 | ..... |
| Average..... | 22,973,266 | ..... | ..... | ..... | ..... | $0 4438 |
| Average per day..... | ..... | $4 92 | $1 01 | $25 70 | $31 63 | ..... |

Interest and Sinking Fund not included in cost of pumping.

### BOROUGH OF QUEENS.

### Lawsuits.

For the first six months of the year, considerable time was given by Assistant Engineer L. C. L. Smith to assist the Corporation Counsel to obtain the necessary data for preparing some cases against the City for alleged diversion.

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## HIGH PRESSURE FIRE SERVICE.

The contracts for furnishing and laying the high pressure mains were completed during the early part of the year, with the exception of the section in the immediate vicinity of the Public Service tunnels on Centre street.

During March the entire system was opened up for service as a low pressure system, except for a few hydrants not then tested, the water being supplied through the 20-inch roundabout connection at Fifth avenue and Twenty-first street, where one of the 48-inch Croton mains had been connected to in April, 1907.

On July 6, 1908, the Croton connection at Twenty-first street and Fifth avenue was permanently shut down, the valve being stripped so that there could be no possibility of opening it by mistake, and the system put into service as a high pressure system. Approximately thirty pounds pressure is kept on the mains at all times, except when a higher pressure is called for by the Fire Department, the pressure being maintained through a 12-inch by-pass at each station which connects the low pressure system direct to the high pressure supply mains and is closed off by a check valve when pumps are in operation.

In September an agreement was entered into with the Public Service Commission by which they would lay the main on Centre street and make all the connections which had been left out at their request during the construction of the subways on that street; the Department to furnish all the pipe, specials, valves and hydrants necessary to do the work.

A contract was prepared for the purchase of the pipe and specials for this work, which was advertised in December, and on December 17 bids were opened, resulting in slightly lower prices than those received in December, 1905.

An inspection of Table No. 1, submitted herewith, shows that in the northern district work commenced in May, 1906, and that by November 1, of the same year, 85 per cent. of the contract had been completed and that by May 3, 1907, 96 per cent. was completed, the remainder being small sections which were held up pending the completion of the pumping station and a short line on Broadway, which the contract required to be done at night only.

Work on the middle district was started in August, 1906, and on August 31, 1907, 96 per cent. was completed, the remainder being held up by other work.

The southern district work was commenced during May, 1907, and was 92 per cent. completed in November of the same year. In this section, the 8 per cent. left

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undone was practically all in the section covered by the construction of the bridge loop subway work, and which is to be taken up within the next month.

The table shows that the maximum month's work was done in July, 1907, when 25,107 linear feet of pipe were laid.

Table II. shows the total quantities in the final estimates for each of the three sections and for all three combined, the last three lines giving the totals in money for the final estimates, for each contract as estimated and the amount by which each is under the estimated cost.

Tests.

During the year a number of tests were made on the system to determine its capability to stand the pressure to be put upon it, its speed of operattion, etc., a short summary of each test being given herewith.

May 6, 8 and 14, pressure tests were made of the northern, middle and southern sections, respectively, the section under pressure each time being carefully patrolled by Inspectors to discover at once any leak or trouble. Pressure gauges were placed in various parts of the section under test, with observers to record the changes in pressure, all records being syncronized with the clock at the South street station.

As the Gansevoort street station was not yet in service, the pumps at the South street station furnished the pressure for all tests.

On May 6 the northern district was put under test. From 10 a. m. to 11.30 a. m. the pressure being held at 100 pounds, from 11.30 a. m. to 1 p. m. at 200 pounds, from 1 p. m. to 1.30 p. m. at 250 pounds, and from 1.30 p. m. to 2 p. m. at 300 pounds. At 2.30 p. m., just before the test was completed, a 24-inch bell and spigot piece, three feet long, broke under 300 pounds pressure in the line on the Bowery, near Hester street. The drop in pressure showing at once at the pumping station, the pumps were at once stopped and very little damage was done, except to the street right over the break which was torn up for about 20 feet by 30 feet.

On May 8 the middle district was put under test from 9.15 a. m. to 10.30 a. m. at 100 pounds, from 10.30 a. m. to 12 m. at 200 pounds, from 12 m. to 1 p. m. at 250 pounds, and from 1 p. m. to 2 p. m. at 300 pounds.

On May 14 the southern district was tested from 10.30 a. m. to 11.30 a. m. at 100 pounds, from 11.30 a. m. to 12.30 p. m. at 200 pounds, from 12.30 p. m. to 1.30 p. m. at 250 pounds, and from 1.30 p. m. to 2.30 p. m. at 300 pounds.

These tests were all in addition to the 600-pound test which the pipe receives at the foundry and the 450 pounds test to which each section between valves receives when laid.

On June 27 the entire system was being put under test preparatory to the exhibition to be given on the following day. The pressure had reached close to 200 pounds and had been on about five minutes when the 16-inch valve at Fifth avenue and Sixteenth street blew apart, the crack being entirely around the valve, a few inches

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High Pressure Fire System, Exhibition October 22, 1908—West Street at West Twelfth Street, Looking South.

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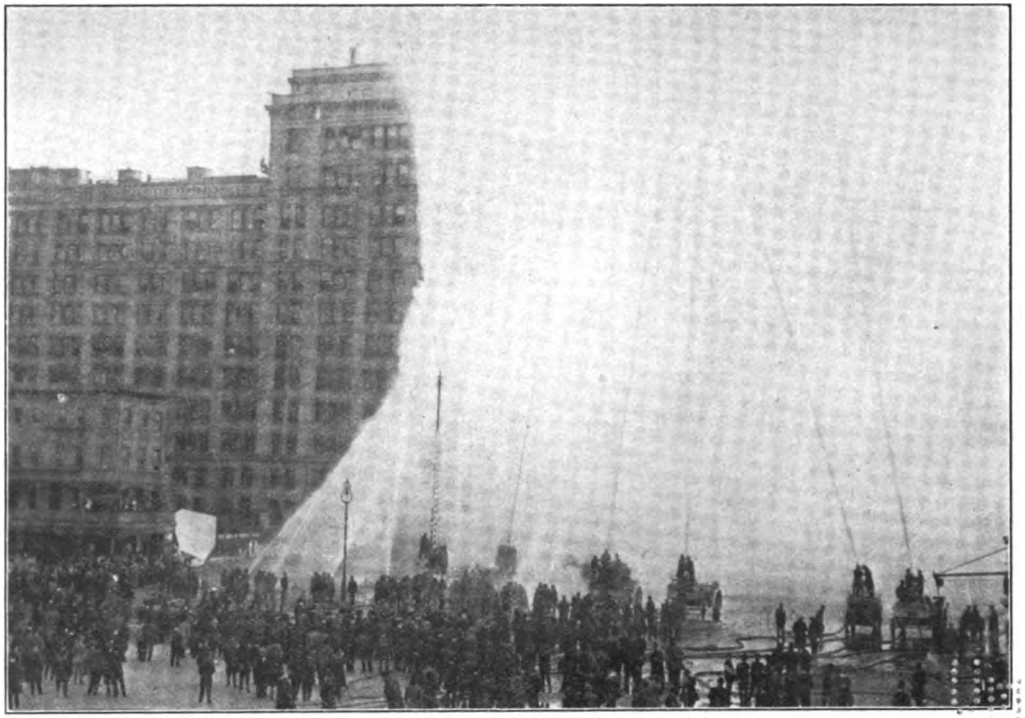

High Pressure Fire System, Exhibition October 22, 1908—West Street at West Twelfth Street, Looking South.

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below the flange joint where the body and dome of the valve are bolted together. With this opening in the line, the pressure was held at 100 pounds with seven pumps running.

June 28, 1908, the first exhibition of the system was given on West street, between Bank and Gansevoort streets. At this exhibition there were twenty-two lines from eight hydrants in play, delivering about 21,000 gallons per minute with a hydrant pressure of 250 pounds and a nozzle pressure of from 70 pounds to 120 pounds, depending on the length of the hose lines.

July 12 an exhibition was given at Union square, at which forty-eight lines were in service, throwing 27,800 gallons of water a minute with a hydrant pressure of 230 to 260 pounds and a nozzle pressure of from 70 to 110 pounds.

September 25, while the system was being tested under pressure, after twenty minutes at 300 pounds a full length piece of 20-inch pipe in Houston street line near Greene street split for its entire length.

October 22 a second exhibition was given on West street, between Bank and Gansevoort streets, at which twenty-six lines were in service, throwing 23,000 gallons of water a minute, with a hydrant pressure of about 260 pounds. While this test was on, one of the high pressure hydrants was connected to the 6-inch standpipe in the fifteen story Western Electric Company building at Bethune and West streets, by three lines of 3-inch hose and from the top of the standpipe, 150 feet above the level of the street, four lines of 2½-inch hose, 100 feet long were brought to the edge of the roof and played out into West street with a nozzle pressure of over 60 pounds per square inch.

November 29 the system was put under pressure for three hours with a pressure of 125 pounds and four hours at 250 pounds, while experiments were being made on the friction loss in hose of varying lengths, both 2½-inch and 3-inch hose being tried.

On December 16, while in service at a fire, the 20-inch valves on Centre street, at Broome street, blew off the end of the line while under a pressure of about 200 pounds. The 20-inch main on Broome street, as well as the 20-inch valve facing to the south, was hung up in chains and on timbers across the excavation for the subway on Centre street, work on extending the line to the south of this valve being held up pending the construction of the subway at this point.

This work had been under all the above mentioned tests and as it was exposed, any defect should have shown during the time the pressure was on. As the subway contractors had been granted permission to cut out the main at the intersection of Broome street and Centre street to make changes in its location due to the construction of the subway to take effect on the 17th, the day following the break, it would appear that due to a desire to be ready in time, they had begun to strip the bracing necessary to hold the valve in place, and, on the pressure being put on for the fire the weakened line separated by the valve moving off the dead end it was on.

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December 9 a meeting of the New York Fire Insurance Exchange was held at which the following resolutions were passed:

"Reducing Rates in High Pressure Zone of Manhattan.

"Whereas, This exchange is informed by the Committee on Fire Prevention of the National Board and by the Committee on Water Supply and Fire Department of the New York Board of Fire Underwriters that the high pressure water service in Manhattan is completed and in commission within the territory bounded by Twenty-third street on the north: Broadway, Third avenue, the Bowery, and Oliver street on the east; Chambers and New Chambers street on the south; and the Hudson River on the west; with the exception of some blocks in Centre, Canal, Nineteenth and Twenty-third streets where subway work is under construction; and

"Whereas, It is felt that thereby the protection against fire hazards in such territory has been materially increased; therefore

"Resolved, That the district charges imposed by vote of May 4, 1906, shall be and are hereby modified and reduced in accordance with the following plan, which plan is hereby approved and adopted, the same to take effect from and after the passage of this vote, but not to apply to policies now in force, except that policies taking effect on and after October 1, 1908, may be given the benefit of this reduction; cancellations of existing policies to be made only at short rates; the aforesaid plan being as follows, viz.:

"Within the territory bounded on the north by Fourteenth street (including both sides of the street); on the east by Third avenue, the Bowery and Oliver street (including both sides of the boundary); on the south by Chambers and New Chambers streets (including both sides of the street); on the west by the Hudson River; reduce the district charge of 15 per cent to 5 per cent., except upon such risks as were originally exempted from the increase of rates imposed May 4, 1906, and also excepting mercantile schedule risks whose rate cards show the presence of excess manufacturing by the notation thereon of 'Excess 1,' 'Excess 2,' 'Excess 3,' etc., which latter shall have their district charge reduced to 10 per cent. instead of 15 per cent. as at present.

"Within the territory bounded on the north by Twenty-third street (including both sides of the street); on the east by Broadway (including both sides of the street); on the south by Fourteenth street (not including either side of that street); and on the west by the Hudson River; reduce the district charge of 10 per cent. to 5 per cent., except upon such risks as were originally exempted from the increase voted May 4, 1906, and also excepting mercantile schedule risks whose rate cards show the presence of excess manufacturing by the notation thereon of 'Excess 1,' 'Excess 2,' 'Excess 3,' etc., upon which the district charge shall remain 10 per cent. as at present.

"Within the territory bounded on the north by Twenty-third street (including both sides of the street); on the east by Broadway to Fourteenth street, Third avenue, the Bowery and Oliver street; on the south by Chambers and New Chambers streets

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High Pressure Fire System, Exhibition July 12, 1908—Union Square North, at Broadway, Looking East.

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High Pressure Fire System, Exhibition June 28, 1908—West Street at West Twelfth Street, Looking South.

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(including both sides of the street); and on the west by the Hudson River (being the entire district now protected by high pressure service); the discounts of December 28, 1903, existing prior to May 4, 1906, upon certain classes of business shall be restored as follows:

"Upon risks rated under mercantile schedule, excepting those both fireproof and non-fireproof whose rate cards show the presence of excess manufacturing, and excepting listed storage stores, private warehouses and fireproof office occupancy risks, 10 per cent.

"Boarding and livery and private business stables, 10 per cent.

"Churches, 10 per cent.

"Breweries, 20 per cent.

"Theatres, 20 per cent.

"Resolved, That it is considered not open to question that the values in the high pressure zone are so enormous, the dangers of fire becoming a conflagration unless properly and promptly handled so serious, and the difficulty of intelligently manipulating high pressure streams so great, as to demand that only experienced firemen of high physical and mental qualifications should be assigned to the fire companies located in the high pressure zone, and that no transfers of company members out of the high pressure zone and substitution of less skilled firemen should be permitted.

"Resolved, That it is the sense of this Exchange that a further reduction in rates would be warranted by the installation in the Borough of Manhattan without delay of a new fire alarm system in accordance with plans and specifications approved by the New York Board of Fire Underwriters.

"Resolved, That the manager be and he is hereby requested to notify the Merchants' Association of New York, the New York Board of Trade and Transportation and the Retail Dry Goods Association of the foregoing action regarding reductions in rates, and to append copies of this and of the two preceding resolutions."

While no absolute figures are in existence showing the actual reduction in premiums paid by the owners and tenants in the high pressure district, an estimate was made by several competent insurance interests that it would conservatively amount to $500,000 per annum.

December 28 orders were given that every twelve hours, unless the pumps had been run during that period for fire service, the pressure was to be raised to 200 pounds and held there for thirty minutes, so that should there be any weakened places in the mains due to excavation work close to it they would show up at a definite time when this discovery would be easy and the cutting out of the defective section quickly attended to.

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## Extension.

In the quarterly report for quarter ending June 30, 1908, the following reference was made regarding the proposed extensions of the high pressure fire system:

"It was originally intended if the high pressure fire system now installed proved successful, to make its first extension cover the territory south of Chambers street down to the Battery and from river to river, and preliminary plans and approximate estimates were made on that basis.

"After further study, however, it seems advisable to give preference to the lower East Side tenement district, extending from the Bowery to the East River, and from Fourteenth street to Chambers street, because, although the values in this territory are not as high as those in the district south of Chambers street or the district above Twenty-third street, the risk of a serious conflagration within it and the danger to life, owing to its crowded condition, as well as the peril to the rest of the city under certain conditions, warrant much more adequate fire protection that it has at present.

"This district may be divided in two parts, i. e., the northern one from Fourteenth to Houston street, and the southern one from Houston to Chambers street. Of these two the southern one offers the greatest danger and therefore needs more immediate attention in case it be found necessary to divide the work and install the high pressure fire service at first in only one of these two sections.

"Although the unit of value as regards the buildings is high in the district from Chambers street to the Battery and from river to river the need of high pressure fire service in that territory is much less pressing because fireproof buildings have largely replaced those of ordinary construction, and private fire fighting appliances have been very generally provided. Furthermore the contents of these buildings, generally used for office purposes, are of little value and the permanent population very small. The installation of the high pressure fire service here may therefore be well deferred until the whole East Side tenement district has been provided for, except that a high pressure fire main be extended along the river front from Chambers street, on the east side, looping around the Battery, to Chambers street on the west side.

"The diagram hereto attached (plate No. 4) shows the proposed extension. The location of the tie main on the loop, as shown, is only tentative, as the laying of this tie main offers the greatest difficulties.

"No additional pumping station will be required for the service of the high pressure fire system as thus extended."

Estimates were made of the cost of construction of these three sections, which were submitted on September 21 to the Board of Estimate and Apportionment, as follows:

| | |
|---|---|
| Section 2—46,000 linear feet of main, 12 to 24-inch, and 275 hydrants.... | $800,000 00 |
| Section 3—124,000 linear feet of mains, 12 to 24-inch, and 600 hydrants.... | 1,800,000 00 |
| Section 4—37,000 linear feet of mains, 12-inch to 24-inch, and 250 hydrants | 500,000 00 |

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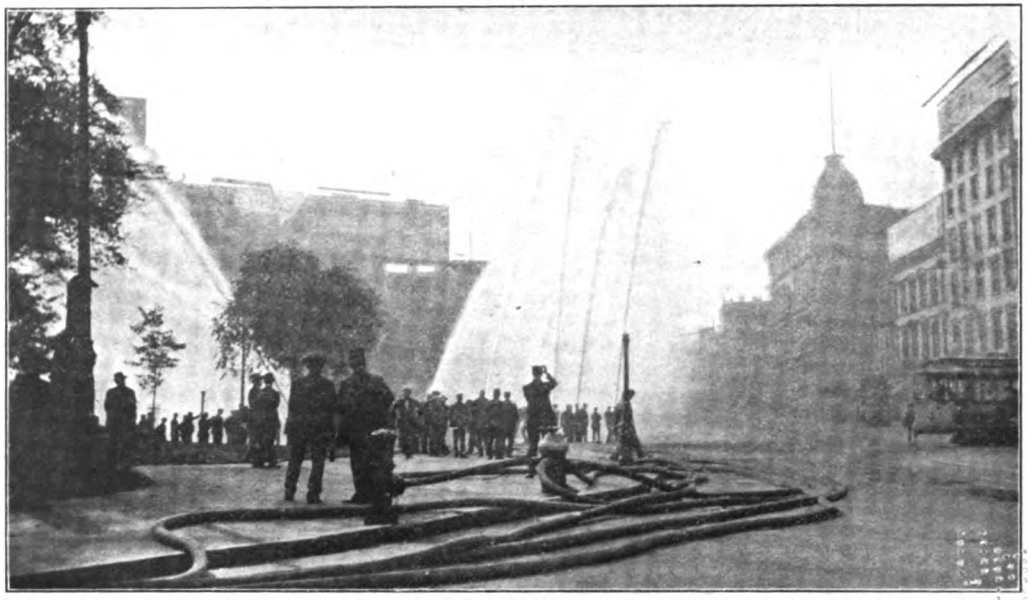

High Pressure Fire System, Exhibition July 12, 1908—Union Square South, at Broadway, Looking East.

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On October 16 the Board of Estimate and Apportionment authorized the expenditure of $1,800,000 for the construction of the section included between Houston street, the Bowery, James street and the East River, the Board of Aldermen approving on November 10, 1908.

Detail plans and specifications are now under way and should be ready for advertising early in the year.

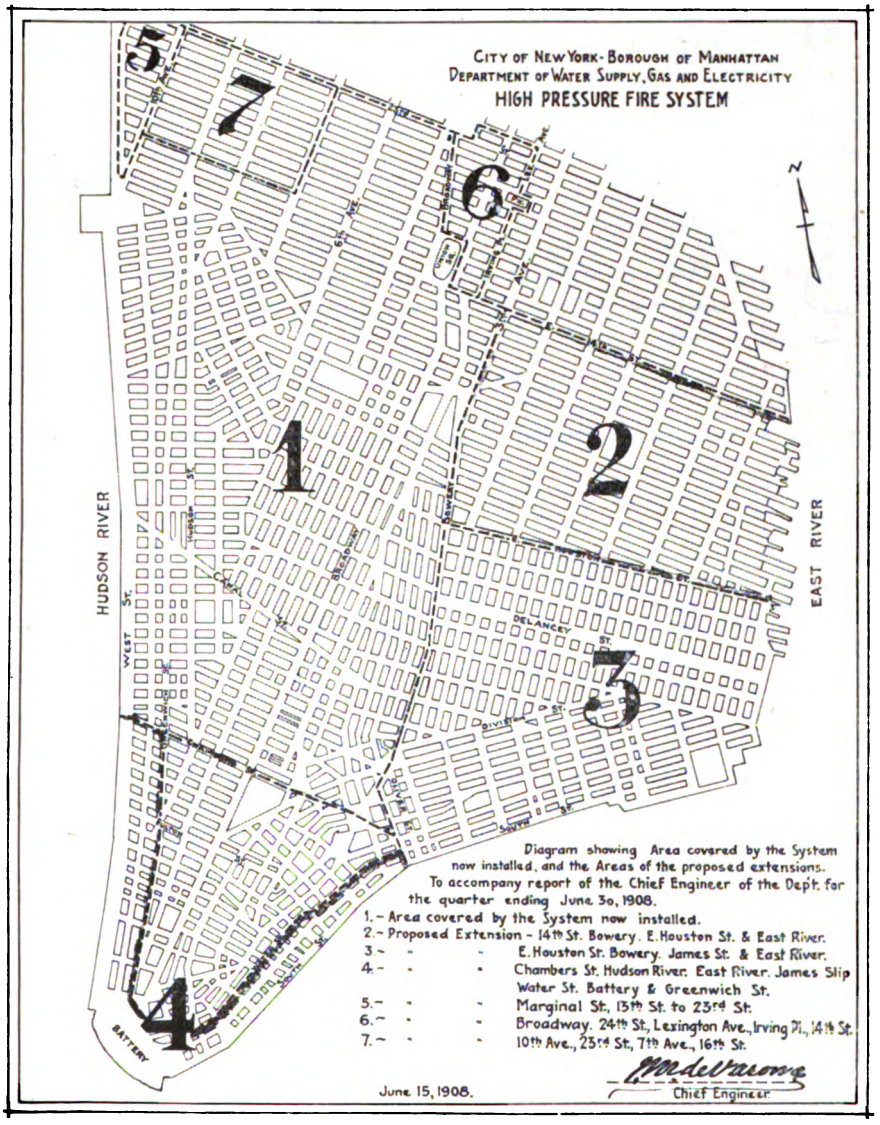
CITY OF NEW YORK - BOROUGH OF MANHATTAN
DEPARTMENT OF WATER SUPPLY, GAS AND ELECTRICITY
HIGH PRESSURE FIRE SYSTEM
HUDSON RIVER
EAST RIVER
1
2
3
4
5
6
7
Diagram showing Area covered by the System now installed, and the Areas of the proposed extensions.
To accompany report of the Chief Engineer of the Dept. for the quarter ending June 30, 1908.
1.- Area covered by the System now installed.
2.- Proposed Extension - 14th St. Bowery. E. Houston St. & East River.
3.- " " E. Houston St. Bowery. James St. & East River.
4.- " " Chambers St. Hudson River. East River. James Slip Water St. Battery & Greenwich St.
5.- " " Marginal St., 13th St. to 23rd St.
6.- " " Broadway. 24th St., Lexington Ave., Irving Pl., 14th St.
7.- " " 10th Ave., 23rd St., 7th Ave., 16th St.
June 15, 1908.
Chief Engineer

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TABLE

Northern

| Diameter of Main. | Estimated Total. | May 31, 1906. | June 30, 1906. | July 31, 1906. | August 31, 1906. | September 30, 1906. | October 31, 1906. | November 30, 1906. | December 31, 1906. | January 31, 1907. | February 28, 1907. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-inch..... | 44,500 | 11,700 | 18,288 | 29,852 | 36,342 | 37,517 | 38,642 | 39,341 | 39,713 | ... | ... |
| 16-inch..... | 8,100 | ..... | 2,511 | 5,419 | 6,783 | 7,486 | 7,885 | 8,020 | 8,096 | ... | ... |
| 20-inch..... | 11,600 | ..... | ..... | 744 | 3,360 | 7,103 | 9,089 | 9,420 | 9,610 | ... | ... |
| 24-inch..... | 14,800 | 2,500 | 3,616 | 4,596 | 6,535 | 7,652 | 8,884 | 10,206 | 10,658 | ... | ... |
| Total..... | 79,000 | 14,200 | 24,415 | 40,611 | 53,020 | 59,758 | 64,500 | 66,987 | 68,077 | ... | ... |
| Per cent..... | 100 | 18 | 31 | 51 | 67 | 76 | 82 | 85 | 86 | ... | ... |
| Hydrants..... | 358 | ..... | 13 | 81 | 135 | 171 | 204 | 214 | 215 | 220 | ... |
| Per cent..... | 100 | ..... | 3⅗ | 23 | 37 | 47 | 57 | 60 | 60 | 61 | ... |

Middle

| Diameter of Main. | Estimated Total. | May 31, 1906. | June 30, 1906. | July 31, 1906. | August 31, 1906. | September 30, 1906. | October 31, 1906. | November 30, 1906. | December 31, 1906. | January 31, 1907. | February 28, 1907. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-inch..... | 59,000 | ..... | ..... | 476 | 3,746 | 9,534 | 18,973 | 24,353 | 25,590 | ... | ... |
| 16-inch..... | 17,000 | ..... | ..... | ..... | 836 | 3,909 | 10,896 | 12,233 | 12,507 | ... | ... |
| 20-inch..... | 9,500 | ..... | ..... | ..... | ..... | ..... | 353 | 1,912 | 1,920 | ... | ... |
| 24-inch..... | 7,800 | ..... | ..... | ..... | 314 | 314 | 365 | 399 | 400 | ... | ... |
| Total..... | 93,300 | ..... | ..... | 476 | 4,896 | 13,757 | 30,587 | 38,898 | 40,417 | ... | ... |
| Per cent..... | 100 | ..... | ..... | 0½ | 5 | 14 | 32 | 41 | 43 | ... | ... |
| Hydrants..... | 444 | ..... | ..... | ..... | 8 | 29 | 51 | 69 | 79 | ... | ... |
| Per cent..... | 100 | ..... | ..... | ..... | 2 | 6 | 11 | 15 | 17 | ... | ... |

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No. 1.

District.

| March 31, 1907. | April 30, 1907. | May 31, 1907. | June 30, 1907. | July 31, 1907. | August 31, 1907. | September 30, 1907. | October 31, 1907. | November 30, 1907. | December 31, 1907. | June 30, 1908. | December 31, 1908. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 39,770 | 39,884 | 41,342 | 42,837 | 43,955 | 43,981 | 43,981 | 44,423 | 44,423 | 44,423 | 44,442.4 | 44,442.4 |
| 8,160 | 8,160 | 8,160 | 8,160 | 8,160 | 8,160 | 8,160 | 8,160 | 8,160 | 8,160 | 8,190.8 | 8,190.8 |
| 9,923 | 10,291 | 11,324 | 11,385 | 11,385 | 11,385 | 11,385 | 11,385 | 11,385 | 11,385 | 11,479.1 | 11,479.1 |
| 10,777 | 13,263 | 14,650 | 14,650 | 14,739 | 14,739 | 14,739 | 14,739 | 14,739 | 14,739 | 14,720.5 | 14,720.5 |
| 68,630 | 71,598 | 75,476 | 77,032 | 78,239 | 78,265 | 78,265 | 78,707 | 78,707 | 78,707 | 78,832.8 | 78,832.8 |
| 87 | 91 | 96 | 98 | 98 | 99 | 99 | 99.6 | 99.6 | 99.6 | 99.8 | 99.8 |
| 238 | 274 | 301 | 312 | 330 | 330 | 330 | 358 | 358 | 358 | 359 | 359 |
| 66 | 76 | 84 | 87 | 92 | 92 | 92 | 100 | 100 | 100 | 100 | 100 |

District.

| March 31, 1907. | April 30, 1907. | May 31, 1907. | June 30, 1907. | July 31, 1907. | August 31, 1907. | September 30, 1907. | October 31, 1907. | November 30, 1907. | December 31, 1907. | June 30, 1908. | December 31, 1908. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ..... | 33,432 | 45,662 | 54,662 | 57,160 | 57,553 | 57,559 | 57,559 | 57,559 | 57,559 | 58,072.9 | 58,072.9 |
| ..... | 12,586 | 14,498 | 15,437 | 16,462 | 16,556 | 16,556 | 16,556 | 16,556 | 16,556 | 16,580.5 | 16,580.5 |
| ..... | 3,102 | 5,094 | 7,248 | 8,666 | 9,098 | 9,372 | 9,372 | 9,372 | 9,372 | 9,387.4 | 9,387.4 |
| ..... | 2,216 | 5,215 | 7,003 | 7,740 | 7,740 | 7,740 | 7,740 | 7,740 | 7,740 | 7,718.8 | 7,718.8 |
| ..... | 51,336 | 70,469 | 84,350 | 90,028 | 90,947 | 91,227 | 91,227 | 91,227 | 91,227 | 91,759.6 | 91,759.6 |
| ..... | 55 | 76 | 90 | 96 | 97 | 98 | 98 | 98 | 98 | 98.3 | 98.3 |
| 97 | 189 | 315 | 364 | 398 | 404 | 406 | 411 | 411 | 411 | 444 | 444 |
| 21 | 42 | 71 | 82 | 89 | 90 | 91 | 93 | 93 | 93 | 100 | 100 |

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Southern

| Diameter of Main. | Estimated Total. | May 31, 1906. | June 30, 1906. | July 31, 1906. | August 31, 1906. | September 30, 1906. | October 31, 1906. | November 30, 1906. | December 31, 1906. | January 31, 1907. | February 28, 1907. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-inch..... | 53,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| 16-inch..... | 22,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| 20-inch..... | 9,500 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| 24-inch..... | 12,700 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| Total..... | 97,200 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| Per cent..... | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| Hydrants..... | 470 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |
| Per cent..... | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ... |

Total Three

| Diameter of Main. | Estimated Total. | May 31, 1906. | June 30, 1906. | July 31, 1906. | August 31, 1906. | September 30, 1906. | October 31, 1906. | November 30, 1906. | December 31, 1906. | January 31, 1907. | February 28, 1907. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-inch..... | 156,500 | 11,700 | 18,288 | 30,328 | 40,088 | 47,051 | 57,615 | 63,694 | 65,303 | ... | ... |
| 16-inch..... | 47,100 | ..... | 2,511 | 5,419 | 7,619 | 11,395 | 18,781 | 20,253 | 20,603 | ... | ... |
| 20-inch..... | 30,600 | ..... | ..... | 744 | 3,360 | 7,103 | 9,442 | 11,332 | 11,530 | ... | ... |
| 24-inch..... | 35,300 | 2,500 | 3,616 | 4,596 | 6,849 | 7,966 | 9,249 | 10,605 | 11,058 | ... | ... |
| Total..... | 269,500 | 14,200 | 24,415 | 41,087 | 57,916 | 73,515 | 95,087 | 105,884 | 108,494 | ... | ... |
| Per cent..... | 100 | 5 | 9 | 15 | 22 | 27 | 35 | 39 | 40 | ... | ... |
| Hydrants..... | 1,272 | ..... | 13 | 81 | 143 | 200 | 255 | 283 | 294 | 299 | 299 |
| Per cent..... | 100 | ..... | 1 | 6 | 11 | 16 | 20 | 22 | 23 | 23 | 23 |

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District.

| March 31, 1907. | April 30, 1907. | May 31, 1907. | June 30, 1907. | July 31, 1907. | August 31, 1907. | September 30, 1907. | October 31, 1907. | November 30, 1907. | December 31, 1907. | June 30, 1908. | December 31, 1908. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ..... | ..... | 30 | 4,678 | 15,959 | 32,635 | 45,699 | 47,806 | 48,880 | 49,324 | 49,408.0 | 51,411.5 |
| ..... | 50 | 384 | 3,133 | 5,910 | 8,215 | 12,679 | 16,834 | 21,495 | 21,983 | 21,983.0 | 22,601.1 |
| ..... | ..... | ..... | 1,431 | 3,129 | 4,170 | 4,170 | 4,861 | 6,208 | 6,218 | 6,218.0 | 6,196.8 |
| ..... | ..... | ..... | 107 | 2,573 | 6,995 | 9,937 | 12,832 | 13,235 | 13,235 | 13,291.0 | 13,306.3 |
| ..... | 50 | 414 | 9,349 | 27,571 | 52,015 | 72,485 | 82,333 | 89,818 | 90,760 | 90,900.0 | 93,515.7 |
| ..... | ..... | .04 | 10 | 28 | 54 | 75 | 85 | 92 | 93 | 94 | 96 |
| ..... | ..... | 2 | 33 | 103 | 171 | 240 | 271 | 271 | 271 | 443 | 458 |
| ..... | ..... | .0½ | 7 | 22 | 36 | 51 | 58 | 58 | 58 | 94 | 97 |

Districts.

| March 31, 1907. | April 30, 1907. | May 31, 1907. | June 30, 1907. | July 31, 1907. | August 31, 1907. | September 30, 1907. | October 31, 1907. | November 30, 1907. | December 31, 1907. | June 30, 1908. | December 31, 1908. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 65,360 | 73,316 | 87,034 | 102,177 | 117,074 | 134,169 | 147,239 | 149,788 | 150,862 | 151,306 | 151,933.0 | 153,926.8 |
| 20,667 | 20,796 | 23,042 | 26,730 | 30,532 | 32,931 | 37,395 | 41,550 | 46,211 | 46,699 | 46,754.0 | 47,372.4 |
| 11,843 | 13,393 | 16,418 | 20,064 | 23,180 | 24,653 | 24,927 | 25,618 | 26,965 | 26,975 | 27,085.0 | 27,063.3 |
| 11,177 | 15,479 | 19,865 | 21,760 | 25,052 | 29,474 | 32,416 | 35,311 | 35,714 | 35,714 | 35,730.0 | 35,745.6 |
| 109,047 | 122,984 | 146,359 | 170,731 | 195,838 | 221,227 | 241,977 | 252,267 | 259,752 | 260,694 | 261,502.0 | 264,108.1 |
| 40 | 46 | 54 | 63 | 73 | 82 | 90 | 94 | 96 | 97 | 97 | 98 |
| 335 | 463 | 618 | 709 | 831 | 905 | 976 | 1,040 | 1,040 | 1,040 | 1,246 | 1,261 |
| 26 | 36 | 48 | 55 | 65 | 71 | 77 | 82 | 82 | 82 | 98 | 99 |

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TABLE

Final Estimates for Furnishing, Delivering

| |
|---|
| Tons of straight cast-iron pipe, furnished and delivered |
| Tons of cast-iron special castings, class "A," furnished and delivered |
| Tons of cast-iron special castings, class "B," furnished and delivered |
| Tons of cast-iron special castings, class "C," furnished and delivered |
| Tons of cast-steel special castings, class "A," furnished and delivered |
| Tons of cast-steel special castings, class "B," furnished and delivered |
| Tons of miscellaneous cast-iron castings, furnished, delivered and set |
| Linear feet of 24-inch delivery pipe, laid |
| Linear feet of 20-inch delivery pipe, laid |
| Linear feet of 16-inch delivery pipe, laid |
| Linear feet of 12-inch delivery pipe, laid |
| Linear feet of 8-inch delivery pipe, laid |
| Linear feet of 6-inch blow-off pipe, laid |
| Linear feet of 36-inch low pressure water pipe, relaid and restored |
| Linear feet of 30-inch low pressure water pipe, relaid and restored |
| Linear feet of 24-inch low pressure water pipe, relaid and restored |
| Linear feet of 20-inch low pressure water pipe, relaid and restored |
| Linear feet of 16-inch low pressure water pipe, relaid and restored |
| Linear feet of 12-inch low pressure water pipe, relaid and restored |
| Linear feet of 8-inch low pressure water pipe, relaid and restored |
| Linear feet of 6-inch low pressure water pipe, relaid and restored |
| Pounds of wrought-iron work, furnished and delivered |
| Pounds of rolled-steel shapes and reinforcing steel, furnished, delivered and set in place |
| 20-inch gate valves, furnished and delivered |
| 16-inch gate valves, furnished and delivered |
| 12-inch gate valves, furnished and delivered |
| 8-inch gate valves, furnished and delivered |
| 6-inch gate valves, furnished and delivered |
| 20-inch gate valves, set |
| 16-inch gate valves, set |
| 12-inch gate valves, set |
| 8-inch gate valves, set |
| 6-inch gate valves, set |
| 4-nozzle post hydrants, hauled and set |

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No. 2.

and Laying High Pressure Fire Mains.

| Unit Price. | Northern District. | Middle District. | Southern District. | Total. |
|---|---|---|---|---|
| $32 00 | $9,253 00 | $8,673 00 | $9,606 00 | $27,514 00 |
| 100 00 | 77 00 | 91 00 | 99 00 | 267 00 |
| 90 00 | 740 00 | 801 00 | 1,143 00 | 2,684 00 |
| 65 00 | 467 00 | 480 00 | 636 00 | 1,583 00 |
| 240 00 | ..... | ..... | ..... | ..... |
| 220 00 | 101 00 | 91 00 | 135 00 | 327 00 |
| 55 00 | 199 00 | 263 00 | 338 00 | 800 00 |
| 1 75 | 15,508 00 | 7,987 00 | 14,028 00 | 37,523 00 |
| 1 35 | 12,111 00 | 10,112 00 | 6,559 00 | 28,782 00 |
| 1 05 | 8,603 00 | 17,487 00 | 23,740 00 | 49,830 00 |
| 70 | 46,562 00 | 61,290 00 | 55,014 00 | 162,866 00 |
| 50 | 9,466 00 | 12,652 00 | 12,914 00 | 35,032 00 |
| 40 | 400 00 | 173 00 | 419 00 | 992 00 |
| 2 25 | ..... | ..... | ..... | ..... |
| 1 50 | ..... | ..... | ..... | ..... |
| 1 25 | ..... | ..... | ..... | ..... |
| 1 00 | ..... | ..... | ..... | ..... |
| 75 | ..... | ..... | ..... | ..... |
| 60 | 1,049 00 | 2,412 00 | 3,715 00 | 7,176 00 |
| 50 | ..... | ..... | ..... | ..... |
| 50 | 2,139 00 | 2,220 00 | 2,126 00 | 6,485 00 |
| 05 | 137,562 00 | 170,527 00 | 241,990 00 | 550,079 00 |
| 06 | 116,421 00 | 155,455 00 | 214,031 00 | 485,907 00 |
| 300 00 | 80 00 | 49 00 | 67 00 | 196 00 |
| 205 00 | 22 00 | 49 00 | 85 00 | 156 00 |
| 120 00 | 134 00 | 243 00 | 220 00 | 597 00 |
| 50 00 | 359 00 | 455 00 | 475 00 | 1,289 00 |
| 30 00 | 18 00 | 11 00 | 18 00 | 47 00 |
| 10 00 | 75 00 | 49 00 | 57 00 | 181 00 |
| 10 00 | 22 00 | 47 00 | 83 00 | 152 00 |
| 7 50 | 134 00 | 241 00 | 209 00 | 584 00 |
| 5 00 | 359 00 | 446 00 | 464 00 | 1,269 00 |
| 5 00 | 16 00 | 11 00 | 16 00 | 43 00 |
| 12 00 | 358 00 | 446 00 | 461 00 | 1,265 00 |

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Cubic yards of earth excavation and backfilling.....

Cubic yards of rock excavation and backfilling.....

Cubic yards of rock excavation without blasting.....

Cubic yards of masonry excavation.....

Cubic yards of brick masonry, in place.....

Cubic yards of rubble masonry, in place.....

Cubic yards of concrete masonry (1-3-6), in place.....

Cubic yards of concrete masonry (1-3-5), in place.....

Square yards of asphalt pavement, including concrete base, relaid and restored.....

Square yards of asphalt pavement, including stone block base, relaid and restored.....

Square yards of granite block pavement, including concrete base, relaid and restored.....

Square yards of stone block pavement, including sand base, relaid and restored.....

Square yards of wooden block pavement, including concrete foundation, relaid and restored.....

Square yards of bluestone flagging, furnished and set in hydrant vaults.....

Square yards of bluestone flagging, including foundations, relaid and restored.....

Square yards of granolithic sidewalk pavement, replaced and restored.....

Linear feet of stone curbing, including foundations, reset and restored.....

Linear feet of granolithic curbing, including foundation, replaced and restored.....

Thousand feet (B. M.) of lumber ordered left in trench.....

Half-inch corporation cocks, furnished and set.....

Linear feet of 24-inch delivery pipe, insulated and waterproofed, complete.....

Linear feet of 20-inch delivery pipe, insulated and waterproofed, complete.....

Linear feet of 16-inch delivery pipe, insulated and waterproofed, complete.....

Linear feet of 12-inch delivery pipe, insulated and waterproofed, complete.....

Square yards of 3-ply felt waterproofing, in place.....

Linear feet of 6-inch vitrified tile drain pipe, furnished and laid.....

Final estimate.....

Estimated cost.....

Balance.....

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| Unit Price. | Northern District. | Middle District. | Southern District. | Total. |
|---|---|---|---|---|
| 95, 1 00, 1 05 | 85,374 00 | 95,372 00 | 99,830 00 | 280,576 00 |
| 5 00 | 65 00 | 3 00 | 6 00 | 74 00 |
| 10 00 | 879 00 | 1 00 | 2 00 | 882 00 |
| 4 00 | 2,685 00 | 2,729 00 | 5,528 00 | 10,942 00 |
| 14 00 | 225 00 | 237 00 | 494 00 | 956 00 |
| 6 00 | 1 00 | 1 00 | 3 00 | 5 00 |
| 7 00 | 1,653 00 | 1,958 00 | 2,160 00 | 5,771 00 |
| 8 00 | ..... | ..... | 68 00 | 68 00 |
| 4 00 | 3,660 00 | 1,290 00 | 428 00 | 5,378 00 |
| 3 50, 3 60, 3 75 | 18,843 00 | 15,853 00 | 5,357 00 | 40,053 00 |
| 2 00 | 4,752 00 | 7,819 00 | 19,380 00 | 31,951 00 |
| 75 | 6,144 00 | 10,419 00 | 8,479 00 | 25,042 00 |
| 4 00 | 120 00 | 72 00 | 3,765 00 | 3,957 00 |
| 5 00 | 2 00 | 30 00 | 62 00 | 94 00 |
| 70 | 436 00 | 551 00 | 852 00 | 1,839 00 |
| 2 25 | 162 00 | 124 00 | 122 00 | 408 00 |
| 30 | 5 00 | 102 00 | 92 00 | 199 00 |
| 1 10 | ..... | ..... | ..... | ..... |
| 50 00 | 112 00 | 125 00 | 161 00 | 398 00 |
| 10 00 | ..... | ..... | ..... | ..... |
| 5 00 | 80 00 | ..... | ..... | 80 00 |
| 4 00 | 23 00 | 4 00 | ..... | 27 00 |
| 3 00 | 36 00 | 169 00 | ..... | 205 00 |
| 2 50 | 16 00 | 79 00 | 500 00 | 595 00 |
| 75 | ..... | ..... | 125 00 | 125 00 |
| 30 | 1,967 00 | 3,157 00 | 2,582 00 | 7,706 00 |
| | $828,469 00 | $845,532 00 | $983,569 00 | $2,657,570 00 |
| | 870,709 00 | 917,330 00 | 1,036,242 00 | 2,823,281 00 |
| | $42,240 00 | $71,798 00 | $52,673 00 | $166,711 00 |

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## High Pressure Pumping Stations.

### Construction.

### South Street Pumping Station.

Building—During the past year this building has been completely finished and accepted by the City. It is of simple but neat design, and is constructed of red brick with black headers, and is laid in English bond. The finish is in limestone.

The construction is fireproof in every particular, all woodwork which enters into the construction is kalsomined, the window lights are wire glass, and all doors and windows are additionally protected by water curtains, which preclude the possibility of fire entering the buildings. These water curtains give a feeling of security to operators who may be compelled to remain in the building during a fire which might surround it.

On the three streets which surround the building, concrete sidewalks have been laid, and a neat and strong wrought iron fence has been erected around the property.

The plot in the rear of the station has been filled with a rich top soil and sodded, and gives a splendid lawn.

The contract for the construction of this building was entered into with T. Cockerill & Son, September 11, 1906, and they were notified to begin work October 1, 1906. The final estimate was signed November 1, 1908. The amount of the contract is $71,334.

Plumbing and Gas Fitting—The contract for the plumbing and gas fitting was finished to the satisfaction of the Department early in the year. This contract was entered into with Frank J. Fee on September 17, 1906, and he was notified to begin work on November 26, 1906. The final estimate was signed September 28, 1908, the amount of the contract being $1,885.

Pumping Machinery—The pumping machinery, electrical work, and all auxiliaries have been completely erected in every particular, and have been in active operation for some months, and have given eminent satisfaction. The first pumping unit turned over under its own power on February 16, and three units delivered water under pressure on March 16.

The discharge from each pump is controlled by a Ross regulating valve, which regulates to any pressure from 50 pounds to 350 pounds. All discharge from the station is charted by Venturi meters.

The contract for this machinery was entered into with Allis-Chalmers Company on November 29, 1905, and they were notified to begin work December 18, 1905. The final estimate was signed December 29, 1908, the amount being $120,331.80.

Venturi Meter Gate Vaults—A contract was entered into with the McHarg-Barton Company, on March 5, 1908, to construct a gate vault for the Venturi meter gates, and

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the contractors were notified to begin work on March 30, 1908. This work was finished to the satisfaction of the Department on June 30, 1908.

Water Curtains—It was deemed wise by the Department to further protect these buildings from a fire hazard, so a system of water curtains was designed to protect each door and window to preclude the possibility of fire entering the building.

From each of the two low pressure supply mains, and from each of the two high pressure discharge mains, a three inch brass pipe is taken to a manifold in the engine room. From this manifold a line of brass pipe is taken to the centre of each wall of the building and controlled by a gate valve. From this point branches are taken to each window, terminating in sprayer heads. When the water is turned on at the manifold the heads completely cover the windows with a curtain of water. The construction of this work is completely satisfactory to the Department.

The contract for this work was entered into with the A. P. Smith Manufacturing Company on March 12, 1908, and they were notified to begin work on April 13, 1908. The final estimate was signed on November 1, 1908, the amount being $7,980, for both stations.

Traveling Crane—A contract was entered into with Alfred Box & Co. on October 19, 1908, to construct and erect a twenty (20) ton traveling crane.

After this crane was built it was tested at the factory and found to completely fulfill the requirements of the specifications. It is now erected and in successful operation in this station. The final estimate was signed December 14, 1908, the amount for this station being $2,690.

Suction Mains for Salt Water—The two (2) thirty-six (36) inch suction mains for this station, together with suction and screen chamber were completed early in the year and connected up with the suction mains of the pumps.

The contractors for this work experienced great difficulty in the construction, due to bad weather conditions and tide water, all of which were overcome in due time, and to the satisfaction of the Department.

A contract for this work was entered into with the Continental Asphalt Paving Company on August 21, 1906, and notification to commence work was given on September 10, 1906. The final estimate was signed on October 17, 1908, the amount being $66,163.08 for both stations.

## Gansevoort Pumping Station.

Building—During the past year this building has been completely finished and accepted by the City. The same design and method of construction obtains in this, as in the building for the South Street Pumping Station, as the buildings are identical, with the exception that the switchboard compartment is at the right of the entrance to the building.

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The contract for the construction of this work was entered into with T. Cockerill & Son, September 11, 1906, and they were notified to begin work October 1, 1906. The final estimate was signed November 1, 1908, the amount being $69,527.

Plumbing and Gas Fitting—The contract for the plumbing and gas fitting was finished to the satisfaction of the Department early in the year. This contract was entered into with Frank J. Fee, on September 17, 1906, and he was notified to begin work on November 26, 1906. The final estimate was signed September 28, 1908, the amount being $1,885.

Pumping Machinery—The pumping machinery, electrical work and all auxiliary apparatus have been completely erected in every particular, and have been in actual operation for some months, and have given complete satisfaction.

The machinery in this station is an exact duplicate of that in the South Street Station.

The contract for this equipment was entered into with the Allis-Chalmers Company on November 29, 1905. They were notified to begin work December 18, 1905. The final estimate was signed December 29, 1908, the amount being $121,504.02.

Venturi Meter Gate Vaults—A contract was entered into with the McHarg-Barton Company on March 5, 1908, to construct a gate vault for the Venturi meter gates, the contractors being notified to begin work on March 30, 1908. This work was finished to the satisfaction of the Department on June 30, 1908.

Water Curtains—The water curtains at this station are an exact duplicate to those in the South Street Station. These have been tested out and accepted by the Department.

Traveling Crane—The crane in this station is an exact duplicate of that in the South Street Station. The contract for this crane was entered into with Alfred Box & Co., on October 19, 1908. It has successfully passed all tests and was accepted by the Department.

The final estimate was signed December 14, 1908, the amount being $2,690.

Suction Mains for Salt Water—The two (2) thirty-six (36) inch suction mains for this station, together with the suction chamber and screen chamber were completed in ample time for use and connected with the suction mains of the pumps. The contractors experienced much difficulty in the construction, due to bad weather and tide conditions.

The contract for this work was entered into with the Continental Asphalt Paving Company on August 21, 1906, and notification to begin work was given September 10, 1906. The final estimate was signed October 17, 1908, the amount being $66,163.08, which included both stations.

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## High Pressure Fire Service.

### Operation.

Although in the annual report for 1905 a pretty full description of the high pressure fire system in Manhattan was given, it may be well, even if repeating a portion of that description, to supplement it with further details in regard to some features of the system and to explain more at length the method of operation.

The territory protected is bounded by West Twenty-third street, Broadway, East Fourteenth street, Third avenue, Bowery, Chambers street and the North River, and the system comprises some fifty-two miles of mains, two pumping stations, each with fresh and salt water connections, and an independent telephone system. The latter is shown on Plate No. 5.

The distribution mains range in size from 24 inches to 12 inches in diameter, with 8-inch connections to hydrants, of which there are 1,261, and are fitted with 2,220 valves.

The pumping stations are located at Gansevoort and West streets and at Oliver and South streets. Fresh water is supplied to each by two separate 36-inch lines which are led thereto by different routes, and into the stations on opposite sides. There are also two separate salt water intakes to each station, and either one of these four different supply lines could furnish sufficient water for the full capacity of the stations.

Each pumping station is equipped with five electrically operated pumping units, the motors being driven by 6,600 volt, 3 phase, 25 cycle current, supplied by The New York Edison Company.

All the principal valves, and the vacuum pumps which are used to raise the salt water to the pump inlets, are operated by 220 volt D. C. motors of from 2 to 25 horsepower capacity.

Each pumping station is equipped to receive the high tension current by four 250,000 circular mil, 3 phase feeders, all being led to the stations by different routes. Two feeders running from the Edison Company's Waterside stations, Nos. 1 and 2, Thirty-eighth to Fortieth street and First avenue, direct to each station, though by different streets and avenues, while the Gansevoort station has two feeders running from the Edison station at Horatio street, and the South street pumping station can take current through two feeders from the Edison station in Duane street.

Each feeder will conduct enough current for the continuous operation of three pumping units, or for four units for a period not exceeding six hours.

The different suction lines and electric feeders being led to the stations by different routes practically insure readiness for operation at all times, as no accident which might be anticipated along the line of supply of either water or current could materially affect the working capacity of the system.

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Within the stations all mains are cross-connected and fitted with valves in such a way that no accident to any pumping unit or piping would put more than one pump out of commission, and would leave at least four units in either station ready for operation.

The rated capacity of each pumping unit is 3,000 gallons of sea water discharged per minute at a pressure of 300 pounds per square inch, but the actual capacity exceeds the rating by about 25 per cent. At 200 pounds pressure, each pump will discharge about 5,000 gallons per minute, so that all the pumps running together would give a discharge of 50,000 gallons per minute, or 3,000,000 gallons per hour.

The motors are of the induction, constant speed type and operate at from 740 to 750 revolutions per minute.

The pumps are of the centrifugal type, having five stages, and are directly connected to the motor by flexible couplings.

The discharge pressure is regulated through a specially designed relief valve, by which any pressure between 50 and 350 pounds per square inch is automatically maintained, so long as the volume of water being taken from the hydrants does not exceed the capacity of the pump or pumps in operation. Any falling off in pressure is an indication that the discharge exceeds the capacity at the required pressure of the apparatus in operation and is the signal to put an additional pump in service.

When three pumps are running in one station, the other station "stands by" and in case additional apparatus is required puts into service one, two or three pumps as may be necessary. If six pumps are not sufficient to meet the demand, a fourth is started in the first station to go in operation, then, if necessary, a fourth in the other station; after that a fifth in the first station and then a fifth in the second station.

Throughout the high pressure district there are installed 214 telephones. They are housed in cast iron boxes, affixed to the exterior walls of buildings, and are so located as to be within a short distance of any fire. The lines connecting these instruments directly with the pumping stations (being independent of and separate from the Telephone Company's central stations) are arranged so that not more than six instruments are on one circuit, and these are so arranged that no two 'phones in the same locality are on the same circuit, so that if any accident should happen to one 'phone, or in the event of the building to which a 'phone is attached being on fire, communication with the pumping station could be maintained directly over another circuit from the next nearest instrument.

All telephones located north of Houston street connect directly with the Gansevoort pumping station, and all south of Houston street with the South street pumping station. All fires in the districts so divided are served from the pumping stations to which 'phones in that district are connected, and the Fire Department officials are thus enabled to give their orders directly to the station in service.

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Each station is equipped with a mechanical telegraph (similar to those used on shipboard for transmitting orders from the bridge to the engine-room) by which the telephone operator in the station immediately transmits all orders received from the Fire Department to the engineer on the pump room floor.

Two tie lines connect the telephone switchboards of the two pumping stations, and each station is connected by direct tie lines with both Fire Headquarters and the New York Edison Company's Waterside Station.

The Gansevoort Station is also connected by a trunk line to the Chelsea central, and the South Street Station to the Orchard central of the New York Telephone Company.

The installation of the High Pressure Fire Service was practically completed at the beginning of June, and tests made as hereinbefore stated.

With a view of arranging details of the service, a meeting was held at the office of the Commissioner of this Department, on July 2, 1908, at which were present the Commissioner of Water Supply, Gas and Electricity, the Commissioner of the Fire Department, the Chief Engineer of the Department of Water Supply, Gas and Electricity and the Chief of the Fire Department, and the following agreement was made and entered into in regard to the operation of the high pressure fire system in the Borough of Manhattan, as follows:

First—From and after 8 a. m. July 6, 1908, the High Pressure Fire System in the Borough of Manhattan shall be permanently in service, so that it may be put in operation whenever required by the Fire Department.

Second—The operation of the high pressure fire stations and their maintenance and repairs, as well as maintenance and repairs of the distribution system, shall remain, as hitherto, under the control of the Department of Water Supply, Gas and Electricity.

Third—The orders to start the pumps for service at the High Pressure Fire Stations, when required, shall be given exclusively and directly to the stations by the representatives of the Fire Department. The latter shall direct the Engineman in charge of the watch at the station when and at what pressure to start the pumps, how the pressure is to be regulated, and when the service is to be stopped, and the Engineman in charge of the stations, during the progress of a fire, from the time the alarm is given until the Fire Department directs that the service at the station be discontinued, shall remain under the orders of the Fire Department.

Fourth—The high pressure fire district is divided into two sections, i. e., the Northern one, extending from Twenty-third street to Houston street, and the Southern one, extending from Houston to Chambers street. While either of the two High Pressure Fire Stations can deliver its full capacity at any point within the system, for the purposes of operation under normal conditions the station at Gansevoort and West streets shall be put into service for all fires north of Houston

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street, and the station at Oliver and South streets shall be put into service for all fires south of Houston street, and the orders to the pumping stations to start the pumps shall be given accordingly.

There has been installed at each of the pumping stations a schedule showing all the fire alarm stations within the High Pressure Fire District, and at each of the stations those fire alarms coming within the district to be served by that station are colored in red. In addition to the above schedule, the stations are provided with the gong, authomatic register, etc.

Whenever required, the full capacity of both stations can be concentrated at any point within the high pressure fire district.

Fifth—Each station has five (5) pumps and motors, each with a capacity of not less than 3,000 gallons per minute, against a pressure at the pumps of 300 pounds, so that the total capacity of each station is not less than fifteen thousand (15,000) gallons per minute against the pressure above given, or a total capacity of not less than thirty thousand (30,000) gallons per minute under the same pressure, which corresponds to a minimum delivery of forty-three million two hundred thousand (43,200,000) gallons in twenty-four (24) hours. At the pressures lower than 300 pounds, the capacity of the pumps will be much larger, the increase in some cases ranging from 25 to 30 per cent. or over.

The pressures can be regulated from 100 to 300 pounds as may be desired.

Sixth—The extreme pressure at the pumps can be transmitted from either station to the most distant point within the system in about two minutes, and the lower pressures in a still shorter time. This fact should be borne in mind when giving the orders to start the stations, in order to prevent wasteful operation of the same.

Seventh—The Engineman in charge of the watch shall not start the pumps at the station when the fire alarm sounds, but shall wait until he receives from the Fire Department the order to start the pumps. When he receives that order the Engineman in charge of the watch, unless otherwise directed, shall start one pump and keep it in operation at a pressure of 100 pounds and continue to thus run this pump until he receives further orders from the Fire Department in regard to change of pressure or discontinuance of the service.

Eighth—As soon as the pumps are no longer needed the Fire Department shall direct the Engineman in charge of the watch at the pumping station to discontinue service. It is important that this notice shall not be delayed in order to avoid waste of current.

Ninth—In case of a break in the mains or at the stations, or any other emergency, the Fire Department shall immediately notify the office of the Commissioner of the Department of Water Supply, Gas and Electricity, the telephone call of which is 8520 Cortland.

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Tenth—The Department of Water Supply has already furnished to the Fire Department copies of report containing full description of the high pressure fire system detailing all its main features, also map of the distribution system showing mains, hydrants and gates, and map showing location of telephone boxes as well as typewritten description of the telephone boxes.

The above data give complete information in regard to the system.

The Department of Water Supply has in preparation maps still more in detail and prepared in a portable form, and will supply copies of them to the Fire Department as soon as completed.

The Fire Department has also received two hundred and ninety (290) keys for the telephone boxes.

The Department of Water Supply will send before the 6th inst. to the Fire Department a dozen 4½ to 3 inch reducers for use if required with the large nozzle of the fire hydrants.

The wrenches which the Fire Department use for the 3-nozzle low pressure hydrants will also open the high pressure fire hydrants. The Department of Water Supply proposes shortly to put a collar on the high pressure fire hydrants so that they may not be opened with the ordinary wrench. When this is done special wrenches will be made and a set of these furnished to the Fire Department.

(Signed) JOHN H. O'BRIEN,
Commissioner of Water Supply, Gas and Electricity.

NICHOLAS J. HAYES,
Commissioner of the Fire Department.

I. M. DE VARONA,
Chief Engineer, Department of Water Supply, Gas and Electricity.

EDW. F. CROKER,
Chief of the Fire Department.

In accordance with the terms of the above, the system went into operation at 8 a. m., July 6, 1908, and has since continued in service.

After a thorough study of the matter, detailed rules and regulations, both for the operation of the high pressure pumping stations and the telephone service, were carefully prepared by the Chief Engineer of this Department, and after your approval of the same, were printed and adopted for the operation of the system.

The original agreement with the Fire Department as to the operation of the system was modified at a conference at the office of the Commissioner of this Department with the representatives of the Fire Department, as follows:

First—Rule 7 of the agreement entered into between the Commissioner of Water Supply, Gas and Electricity and the Commissioner of the Fire Department on July 2,

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1908, for the operation of the high pressure fire system, shall be no longer in force on and after 8 a. m., November 20, 1908.

Second—The following rule shall take the place of Rule 7, above referred to, and shall be enforced on and after 8 a. m., November 20, 1908, i. e.:

Rule 7. Immediately on receipt at the station of a fire alarm within the high pressure fire service district assigned to that station, the Engineman in charge shall start the pumps and keep them in operation at a pressure of 125 pounds in the Borough of Manhattan, and of 75 pounds in the Borough of Brooklyn, until he receives orders from the Fire Department either to change the pressure or discontinue the service. In case it be found that the high pressure fire service is not required at the fire, the Fire Department hereby agrees to notify the pumping station to discontinue the operation of the pumps within not more than six minutes after the first alarm is received.

(Signed) JOHN H. O'BRIEN,
Commissioner of Water Supply, Gas and Electricity.

NICHOLAS. J. HAYES,
Commissioner of the Fire Department.

I. M. DE VARONA,
Chief Engineer, Department of Water Supply, Gas and Electricity.

EDW. F. CROKER.
Chief of the Fire Department.

From July 6, 1908, to November 20, 1908, the pumping stations were called into service for seventeen fires. From the time the amended agreement became effective, November 20, 1908, at 8 a. m., until December 31, 1908, pumps were put in service in response to the one hundred and sixteen first alarms received, and from the best available information, water was used in fifty-five instances, making a total of seventy-two fires for which the high pressure service was used.

To insure readiness for service at all times, periodical tests are made. Previous to November 20, 1908, or during the period when the pumps were started only on telephoned orders from the Fire Department, one pump was operated during every watch in each station, and the regulating valve tested, the pumping units being taken consecutively during the succeeding watches. Since November 20. the numerous short runs on false alarms and cases where no water is required has minimized the advisability of running so many regular tests, and they are only applied when the system has not been put in service during the half day. In such an event, the system not having been under pressure from midnight to 7.30 a. m., a test is made for thirty minutes at 200 pounds pressure, during which time each of the fire pumps in one of the stations is operated for a space of six minutes. If the system has not been under pressure from noon to 4.30 p. m., a similar test is made at the other pumping station. These hours have been determined so that in the event of any trouble in the dis-

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tribution system, the repair gangs could be found at their quarters and hurried to the scene of the trouble to make any necessary repairs or to manipulate the street valves.

Each pumping station is under the charge of an Engineer designated "Engineman-in-Charge," and the day is divided into three watches of eight hours each. Each watch crew consists of one Engineer, one Oiler, one Telephone Operator, and one Laborer. The suction and discharge pressures, and the volume of water discharged are at all times automatically and indelibly registered by recording gauges.

Following are the data of the operations of the pumping stations:

Gansevoort Pumping Station.

| Date | Alarm Box. | Start. | Stop. | Pump, Minutes. | Water Discharged. | Current Consumed, Kilowatt Hours. |
|---|---|---|---|---|---|---|
| July 9 | 372 | 10.00 a. m. | 10.33 a. m. | 33 | 42,000 | 450 |
| July 16 | 259 | 7.50 p. m. | 8.31 p. m. | 41 | 57,000 | 600 |
| July 25 | 279 | 2.57 p. m. | 3.12 p. m. | 15 | 21,000 | 325 |
| September 12 and 13 | 282 | 5.25 p. m. | 5.56 a. m. | 1,248 | 3,110,000 | 16,600 |
| September 25 | 212 | 3.43 a. m. | 4.09 a. m. | 26 | 34,000 | 225 |
| October 3 | 237 | 8.43 p. m. | 8.54 p. m. | 11 | 6,000 | 150 |
| October 3 and 4 | 268 | 11.30 p. m. | 1.22 a. m. | 112 | 37,000 | 1,075<br>400 |
| October 17 | 279 | 4.30 p. m | 4.49 p. m. | 19 | 10,000 | 200 |
| October 21 | 398 | 1.37 a. m. | 1.50 a. m. | 13 | 8,000 | 200 |
| October 22, Special test. | | | | | | |
| November 1 | 236 | 9.19 p. m. | 10.16 p. m. | 57 | 43,000 | 700 |
| November 20 | 349 | 11.17 p. m. | 11.21 p. m. | 4 | ..... | 125 |
| November 21 | 356 | 11.43 a. m. | 12.03 p. m. | 20 | 17,000 | 275 |
| November 21 | 261 | 9.49 p. m. | 10.21 p. m. | 32 | 40,000 | 450 |
| November 22 | 343 | 7.41 a. m. | 7.45 a. m. | 4 | ..... | 50 |
| November 22 | 253 | 7.52 p. m. | 7.55 p. m. | 3 | ..... | 125 |
| November 24 | 372 | 4.52 p. m. | 4.58 p. m. | 6 | ..... | 50 |
| November 24 | 357 | 7.41 p. m. | 7.45 p. m. | 4 | ..... | 50 |
| November 24 | 268 | 11.45 p. m. | 11.49 p. m. | 4 | ..... | 75 |
| November 25 | 268 | 12.16 a. m. | 12.19 a. m. | 3 | ..... | 50 |
| November 25 | 292 | 8.32 p. m. | 8.52 p. m. | 20 | 15,000 | 250 |
| November 27 | 271 | 3.46 p. m. | 4.02 p. m. | 16 | 9,000 | 200 |
| November 27 | 338 | 8.12 p. m. | 8.24 p. m. | 12 | 5,000 | 125 |
| November 28 | 318 | 4.13 p. m. | 4.20 p. m. | 7 | 3,000 | 100 |
| November 30 | 292 | 8.54 p. m. | 9.10 p. m. | 10 | 9,000 | 250 |
| December 1 | 376 | 11.32 a. m. | 11.36 a. m. | 4 | ..... | 25 |
| December 1 | 353 | 7.06 p. m. | 7.11 p. m. | 5 | ..... | 75 |

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| Date. | Alarm Box. | Start. | Stop. | Pump, Minutes. | Water Discharged. | Current Consumed, Kilowatt Hours. |
|---|---|---|---|---|---|---|
| December 2..... | 268 | 1.28 a. m. | 1.31 a. m. | 3 | ..... | 50 |
| December 2..... | 324 | 10.37 a. m. | 10.43 a. m. | 6 | ..... | 25 |
| December 2..... | 258 | 5.23 p. m. | 5.33 p. m. | 10 | 12,000 | 150 |
| December 3..... | 255 | 2.15 a. m. | 2.22 a. m. | 7 | 2,000 | 75 |
| December 3..... | 354 | 11.07 a. m. | 11.11 a. m. | 4 | ..... | 50 |
| December 4..... | 264 | 5.19 a. m. | 6.39 a. m. | 80 | 61,000 | 1,000 |
| December 7..... | 265 | 8.12 a. m. | 8.17 a. m. | 5 | ..... | .... |
| December 9..... | 251 | 5.53 p. m. | 6.16 p. m. | 23 | 15,000 | 150 |
| December 9..... | 283 | 7.01 p. m. | 7.06 p. m. | 5 | ..... | 50 |
| December 10..... | 320 | 1.35 a. m. | 1.40 a. m. | 5 | ..... | 50 |
| December 10..... | 313 | 9.14 a. m. | 9.21 a. m. | 7 | ..... | 50 |
| December 10..... | 253 | 5.14 p. m. | 6.02 p. m. | 48 | 31,000 | 325 |
| December 11..... | 258 | 11.51 a. m. | 12.01 p. m. | 10 | 6,000 | 125 |
| December 12..... | 339 | 2.24 a. m. | 2.39 a. m. | 5 | ..... | 100 |
| December 12..... | 278 | 3.37 p. m. | 4.57 p. m. | 80 | 62,000 | 600 |
| December 14..... | 373 | 6.07 p. m. | 6.24 p. m. | 17 | 10,000 | 125 |
| December 14..... | 262 | 10.26 p. m. | 11.07 p. m. | 41 | 20,000 | 350 |
| December 15..... | 334 | 2.37 p. m. | 2.40 p. m. | 3 | ..... | 25 |
| December 15..... | 376 | 4.54 p. m. | 4.59 p. m. | 5 | ..... | 25 |
| December 16..... | 267 | 10.38 p. m. | 10.52 p. m. | 14 | 10,000 | 75 |
| | 358 | 10.39 p. m. | 10.52 p. m. | | | |
| December 16..... | 291 | 11.36 p. m. | 11.43 p. m. | 7 | ..... | 75 |
| December 19..... | 343 | 5.15 a. m. | 5.19 a. m. | 4 | ..... | 50 |
| December 19..... | 351 | 3.36 p. m. | 3.40 p. m. | 4 | ..... | 25 |
| December 21..... | 283 | 9.01 a. m. | 9.07 a. m. | 6 | ..... | 50 |
| December 23..... | 255 | 8.22 a. m. | 9.05 a. m. | 43 | 43,000 | 300 |
| December 24..... | 370 | 11.14 a. m. | 11.25 a. m. | 11 | 11,000 | 150 |
| December 24..... | 232 | 10.35 p. m. | 10.40 p. m. | 5 | ..... | 50 |
| December 26..... | 354 | 7.27 p. m. | 7.34 p. m. | 7 | ..... | 150 |
| December 27..... | 359 | 3.44 p. m. | 3.51 p. m. | 7 | ..... | 75 |
| December 27..... | 337 | 6.32 p. m. | 6.36 p. m. | 4 | ..... | 75 |
| December 28..... | 254 | 12.23 p. m. | 12.48 p. m. | 25 | 22,000 | 350 |
| December 29..... | 257 | 2.38 p. m. | 2.43 p. m. | 5 | ..... | 50 |
| December 30..... | 322 | 7.34 a. m. | 7.41 a. m. | 7 | ..... | 100 |
| December 30..... | 351 | 8.37 p. m. | 8.41 p m. | 4 | ..... | 25 |
| December 31..... | 286 | 5.13 p. m. | 5.19 p. m. | 6 | ..... | 50 |
| Total Gansevoort Pumping Station..... | | | | | 3,771,000 | 28,175 |

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South Street Pumping Station.

| Date. | Alarm Box. | Start. | Stop. | Pump, Minutes. | Water Discharged. | Current Consumed, Kilowatt Hours. |
|---|---|---|---|---|---|---|
| July 17 | 89 | 9.39 p. m. | 9.52 p. m. | 13 | ..... | 150 |
| September 8 | 104 | 5.28 a. m. | 5.44 a. m. | 16 | 27,000 | 200 |
| September 17 and 18 | 219 | 8.56 p. m. | 12.25 a. m. | 209 | 350,000 | 2,700 |
| October 28 | 124 | 2.24 a. m. | 3.10 a. m. | 46 | 30,000 | 650 |
| November 7 | 144 | 4.37 a. m. | 5.40 a. m. | 63 | 75,000 | 850 |
| November 17 | 141 | 9.38 a. m. | 12.15 p. m. | 204 | 175,000 | 2,650 |
| November 21 | 165 | 7.48 p. m. | 7.58 p. m. | 10 | 20,000 | 100 |
| November 22 | 191 | 6.40 a. m. | 6.45 a. m. | 5 | ..... | 100 |
| November 23 | 216 | 4.01 p. m. | 4.09 p. m. | 8 | ..... | 100 |
| November 23 | 67 | 7.09 p. m. | 7.16 p. m. | 7 | ..... | 100 |
| November 23 | 147 | 9.22 p. m. | 12 midnight | 252 | 585,000 | 4,400 |
| November 24 | 147 | Midnight | 2.35 a. m. | 155 | 170,000 | 1,100 |
| November 24 | 214 | 9.47 a. m. | 9.50 a. m. | 3 | ..... | .... |
| November 24 | 112 | 1.02 p. m. | 1.06 p. m. | 4 | ..... | 100 |
| November 24 | 145 | 7.40 p. m. | Midnight | 260 | 390,000 | 3,300 |
| November 25 | 145 | Midnight | 1.47 a. m. | 107 | 65,000 | 1,400 |
| November 25 | 169 | 12.47 p. m. | 1.24 p. m. | 37 | 40,000 | 400 |
| November 25 | 223 | 7.42 p. m. | 7.50 p. m. | 8 | ..... | 100 |
| November 27 | 223 | 1.52 p. m. | 1.55 p. m. | 3 | ..... | 50 |
| November 28 | 114 | 10.02 a. m. | 11.27 a. m. | 85 | 50,000 | 1,000 |
| November 28 | 129 | 4.55 p. m. | 5.00 p. m. | 5 | ..... | 100 |
| November 28 | 148 | 11.48 p. m. | 11.54 p. m. | 6 | ..... | 100 |
| December 1 | 187 | 2.10 a. m. | 2.18 a. m. | 8 | 10,000 | 100 |
| December 1 | 167 | 10.35 p. m. | 11.07 p. m. | 32 | 55,000 | 500 |
| December 1 | 145 | 8.53 p. m. | 9.06 p. m. | 13 | 25,000 | 200 |
| December 3 | 184 | 10.31 a. m. | 10.36 p. m. | 5 | ..... | 100 |
| December 4 | 216 | 3.08 a. m. | 3.24 p. m. | 16 | 10,000 | 200 |
| December 5 | 185 | 7.15 p. m. | 8.21 p. m. | 66 | 53,000 | 800 |
| December 6 | 109 | 4.06 p. m. | 4.11 p. m. | 5 | ..... | 50 |
| December 6 | 189 | 8.33 p. m. | 8.36 p. m. | 3 | ..... | 100 |
| December 7 | 162 | 8.19 p. m. | 8.22 p. m. | 3 | ..... | 50 |
| December 8 | 122 | 4.13 a. m. | Midnight | 1,702 | | |
| December 9 | 122 | Midnight | 11.45 a. m. | 705 | | |
| December 9 | 123 | 4.40 p. m. | 4.46 p. m. | .... | | |
| December 9 | 128 | 3.56 a. m. | 5.12 a. m. | 76 | 4,670,000 | 30,850 |
| December 9 | 234 | 6.42 a. m. | 7.44 a. m. | 62 | | |
| December 10 | 168 | 10.38 a. m. | 10.44 a. m. | 6 | | |

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| Date. | Alarm Box. | Start. | Stop. | Pump, Minutes. | Water Discharged. | Current Consumed, Kilowatt Hours. |
|---|---|---|---|---|---|---|
| December 11..... | 187 | 9.35 a. m. | 9.45 a. m. | 10 | 8,000 | 100 |
| December 12..... | 147 | 11.06 p. m. | 11.22 p. m. | 16 | 15,000 | 200 |
| December 15..... | 168 | 4.33 p. m. | 4.36 p. m. | 3 | ..... | 50 |
| December 16..... | 168 | 7.11 a. m. | 7.40 a. m. | 46 | 110,000 | 550 |
| December 16..... | 187 | 5.37 p. m. | 5.49 p. m. | 27 | 10,000 | 400 |
| December 16..... | 236 | 7.59 p. m. | 8.05 p. m. | 6 | ..... | 50 |
| December 18..... | 116 | 8.37 a. m. | 8.43 a. m. | 6 | ..... | 100 |
| December 18..... | 131 | 7.34 p. m. | 7.41 p. m. | 7 | ..... | 100 |
| December 18..... | 102 | 9.53 p. m. | 10.08 p. m. | 15 | 10,000 | 200 |
| December 19..... | 213 | 3.04 p. m. | 3.09 p. m. | 3 | ..... | .... |
| December 20..... | 183 | 7.56 p. m. | 8.00 p. m. | 4 | ..... | 50 |
| December 21..... | 109 | 3.17 p. m. | 3.23 p. m. | 6 | ..... | 100 |
| December 21..... | 115 | 3.27 p. m. | 3.32 p. m. | 5 | ..... | .... |
| December 21..... | 221 | 4.49 p. m. | 4.54 p. m. | 5 | ..... | 100 |
| December 21..... | 129 | 9.00 p. m. | 9.41 p. m. | 41 | 30,000 | 550 |
| December 21..... | 233 | 9.52 p. m. | 10.09 p. m. | 17 | 13,000 | 200 |
| December 22..... | 125 | 5.59 p. m. | 8.19 p. m. | 140 | 1,500 | 1,700 |
| December 23..... | 147 | 3.04 p. m. | 3.15 p. m. | 11 | 5,000 | 100 |
| December 24..... | 109 | 6.55 p. m. | 7.12 p. m. | 17 | 13,000 | 200 |
| December 26..... | 216 | 7.18 a. m. | 7.40 a. m. | 22 | 18,000 | 300 |
| December 26..... | 216 | 1.11 p. m. | 1.15 p. m. | 4 | ..... | 50 |
| December 26..... | 183 | 7.15 p. m. | 7.33 p. m. | 18 | 13,000 | 200 |
| December 26..... | 204 | 11.51 p. m. | Midnight | 8 | | 100 |
| December 27..... | 204 | Midnight | 12.23 a. m. | 23 | 25,000 | 300 |
| December 27..... | 114 | 9.30 p. m. | 10.39 p. m. | 69 | 40,000 | 950 |
| December 28..... | 170 | 12.20 p. m. | 1.39 p. m. | 59 | 32,000 | 750 |
| December 28..... | 119 | 5.05 p. m. | 5.10 p. m. | 5 | ..... | 50 |
| December 28..... | 236 | 7.34 p. m. | 7.40 p. m. | 6 | ..... | 100 |
| December 28..... | 168 | 8.27 p. m. | 8.40 p. m. | 13 | 10,000 | 200 |
| December 29..... | 163 | 9.13 p. m. | 9.26 p. m. | 13 | 10,000 | 100 |
| December 30..... | 236 | 3.21 a. m. | 3.34 a. m. | 13 | 10,000 | 150 |
| December 30..... | 184 | 6.00 p. m. | 6.03 p. m. | 3 | ..... | 100 |
| December 30..... | 241 | 8.21 p. m. | 8.30 p. m. | 9 | 4,000 | 50 |
| December 31..... | 122 | 12.32 a. m. | 12.55 a. m. | 23 | 21,000 | 350 |
| December 31..... | 167 | 2.15 a. m. | 2.24 a. m. | 9 | 11,000 | 100 |
| December 31..... | 141 | 10.31 p. m. | 10.35 p. m. | 4 | ..... | 100 |
| Total, South Street Station..... | | | | | 7,268,000 | 61,300 |

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Current Consumed and Cost.

South Street Station—

| | Kilowatt Hours. | | |
|---|---|---|---|
| Feeder No. 1 | 225,250 | | |
| Feeder No. 2 | 31,100 | | |
| Feeder No. 3 | 100 | | |
| Feeder No. 4 | 103,750 | | |
| | 360,200 | at 1½ cents per kilowatt hour, | $5,403 00 |
| Charged to contractor | 181,700 | | 2,725 50 |
| Net cost to Department | | | $2,677 50 |

Gansevoort Station—

| | Kilowatt Hours. | | |
|---|---|---|---|
| Feeder No. 1 | 80,175 | | |
| Feeder No. 2 | 1.000 | | |
| Feeder No. 3 | 300 | | |
| Feeder No. 4 | 8,725 | | |
| | 90,190 | at 1½ cents per kilowatt hour, | $1,352 85 |
| Charged to contractor | 34,675 | | 510 12 |
| Net cost to Department | | | $842 73 |

Current Consumed.

6,600 Volt, 3 Phase, 25 Cycle (A. C.).

South Street—

| | Kilowatt Hours. |
|---|---|
| Feeder No. 1 (Waterside) | 225,500 |
| Feeder No. 2 (Duane street) | 31,100 |
| Feeder No. 3 (Duane street) | 100 |
| Feeder No. 4 (Waterside) | 103,750 |
| Gansevoort Street— | |
| Feeder No. 1 (Waterside) | 80,175 |
| Feeder No. 2 (Horatio street) | 1,000 |
| Feeder No. 3 (Horatio street) | 300 |
| Feeder No. 4 (Waterside) | 84,900 |
| Total | 526,575 |

526,575 kilowatt hours at 1½ cents, $7,898.63.

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Charged to Contractor for Current Used in Preliminary Tests—

| | Kilowatt Hours. | |
|---|---|---|
| South street | 181,700 | |
| Gansevoort | 34,675 | |
| | | 216,375 |

Current Consumed While Pumping on Fires—

| | Kilowatt Hours. | |
|---|---|---|
| South street | 61,300 | |
| Gansevoort | 28,175 | |
| | | 89,475 |

Current Consumed During Departmental Tests—

| | Kilowatt Hours. | |
|---|---|---|
| South street | 117,200 | |
| Gansevoort | 103,525 | |
| | | 220,725 |

Consumption and Cost of Low Tension (Direct) Current.

Gansevoort Pumping Station.

| | Kilowatt Hours. | | |
|---|---|---|---|
| Power Meter No. 1 | 449 | | |
| No. 2 | 571 | | |
| Total | 1,020 | at 6 cents, | $61 20 |
| Lighting | 6,709 | at 7½ cents, | 503 18 |

South Street Pumping Station.

| | | | |
|---|---|---|---|
| Power meter No. 1 | 49 | | |
| No. 2 | 485.6 | | |
| Total | 534.6 | at 6 cents, | 32 07 |
| Lighting | 5,781.2 | at 7½ cents, | 433 59 |
| Total cost of direct current | | | $1,030 04 |

Description of Main Fires.

The system was put into service officially on July 6, 1908, and on July 9 was called upon for service at its first fire in Twenty-fourth street, one block north of its northerly hydrant.

On September 12 the first large fire occurred in the high pressure district at the southeast corner of West and Bank streets, in the building occupied by Enoch Morgan

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& Sons, as a soap factory. The first alarm was rung in at 4.40 p. m. and the high pressure station at Gansevoort and West streets was called on for service at 5.25 p. m. Owing to the nature of its contents, this was a very hot and stubborn fire, requiring twelve hours of service from the high pressure station, in which time 3,110,000 gallons of water were thrown on the fire from the high pressure hydrants alone, which is equivalent to filling the site covered by the building 45 feet deep with water.

On November 23, the South street station was called on for service at the fire in the building at the intersection of Canal, Walker and Baxter streets. At this fire there was considerable difficulty in getting water, both from the high pressure as well as the general system, owing to the construction work going on in the immediate vicinity due to the building of the bridge loop subways on Centre, Canal and Walker streets. At this fire the first alarm was rung at 9.21 p. m., and the high pressure station called on for service at 9.22 p. m. During the five hours the station was in service, 755,000 gallons of water were pumped.

Early in the morning of December 8, 1908, the system was called on for its largest fire of the year, in the seven-story building at No. 152 Franklin street, used by the Western Union Telegraph Company as a storehouse. The location of the building was in the centre of a dangerous zone, with wholesale whiskey and wine warehouses on both sides with barrels of spirits piled to the ceiling on all floors. On the arrival of the first company, the flames were reaching from the bottom to top of the building and it was evident that it would be impossible to do anything to save the building on fire and difficult to prevent the fire spreading. After the companies responding to the second alarm had gone into service, there were fifteen lines from the high pressure hydrants playing on the burning building, which in three hours had the fire under control. The first alarm was rung in at 4.13 a. m. on the 8th and the order to shut down received at 11.45 a. m. on the 9th, during which time 4,670,000 gallons were thrown on the fire. As the building which was on fire covered but 50 feet by 90 feet, this was equivalent to a depth of water of 140 feet over the entire area on fire.

## Filtration of the Croton Water Supply.

As stated in last year's report, our plans for filtering the Croton water supply, as well as the specifications and estimates, are entirely completed, but no appropriation has yet been granted to carry out this work.

Respectfully submitted,

I. M. DE VARONA, Chief Engineer.

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# ANNUAL REPORT OF THE BUREAU OF LAMPS AND LIGHTING AND THE BUREAU OF ELECTRICAL INSPECTION FOR THE YEAR 1908.

Department of Water Supply, Gas and Electricity,
Bureau of Lamps and Lighting, Nos. 13 to 21 Park Row,
New York, June 1, 1909.

Hon. JOHN H. O'BRIEN, Commissioner:

Dear Sir—I beg leave to submit herewith the annual report for the year 1908 of the Bureau of Lamps and Lighting in all five Boroughs. I also submit the report of the Electrical Bureau, also for the five Boroughs.

The report of the Bureau of Lamps and Lighting in general follows the same lines as the report for 1907, the tabulations giving the statistical engineering and financial data on which the results are based.

In addition to a general report by myself, this report is divided into the following sections, reported by the officers in charge of the various Divisions. These reports are:

First—Report from Professor George F. Sever, Consulting Engineer of the Department, on the testing of electric meters during the year 1908 by Columbia University, under our contract with them.

Second—Report from the Chief Gas Examiner, Dr. E. G. Love, on the results of his tests during the year 1908, in accordance with the lighting laws of 1905.

Third—Report from Mr. H. R. Emerson, Auditor, on the several accounts of the lighting companies in the years 1903, 1904, 1905 and up to January 1, 1909.

A detailed statement showing the number of lamps in Greater New York January 1, 1908, as compared with January 1, 1909.

A summary and detailed financial statement is given for Boroughs of Manhattan and The Bronx, the Borough of Brooklyn, Borough of Queens and Borough of Richmond, separately, showing the detailed expenditurees and outstanding liabilities for lighting public streets and buildings, heat and power service, repairs, salaries and Bureau expenses; also giving the same by companies as well as by totals, and including a general recapitulation of these accounts in all these Boroughs for the year.

Fourth—A general report by Mr. W. G. Quirk, Chief Inspector in charge of street lighting in the five Boroughs.

These reports give the changes during the year in each Borough in complete detail by contractors' districts. A resumé is also given showing these changes by Boroughs, with a tabulation of the increase and decrease on each type of lighting for the Greater City.

Table showing the number and kind of repairs made to gas lamp-posts in the Boroughs of Manhattan and The Bronx.

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A detailed list showing the locations in which new lamps were installed by each of the companies in the five Boroughs.

Statement showing mileage of streets lighted by electricity, gas and naphtha in the Boroughs of Manhattan and The Bronx, and a detailed statement showing the length of mains in use by each gas company in the Greater City.

A comparative table showing changes in the number of lamps and estimated candle power given by same for the years 1901 to 1908, inclusive, by Boroughs and by years.

Table showing the schedule or time table by which the lamps are lighted in all Boroughs. This time table is prepared in accordance with the lighting laws of 1905 which govern this matter.

Table showing the bids received by the Department for the years 1908 and 1909 from the various companies contracting for same.

Fifth—A report by Mr. P. Porcella, showing the details of the lighting administration, and giving a comparison of the extinguishments reported by the Inspectors of the Bureau, police and lighting companies in the Boroughs of Manhattan and The Bronx during the year 1908.

An inventory giving the disposition of supplies for repairs to public lamps and lamp-posts.

Statement giving list of permits granted for the erection of private lamps on public highways during the year.

Statement showing the amount collected for the breakage of lamps and lamp-posts throughout Manhattan and The Bronx for the year.

Sixth—A detailed report covering the street lighting in the Borough of Brooklyn from Mr. J. F. Bussing, General Inspector.

Seventh—A detailed report as to the street lighting in the Borough of Queens from Mr. N. I. Clarkin, General Inspector.

Eighth—Copy of ordinances as revised by the Corporation Counsel and suggested by this Department to the Board of Aldermen to provide rules and regulations for lamp-posts on the streets.

Ninth—Report from Mr. F. J. McGuire, Chief Inspector of Public Buildings in Manhattan and The Bronx, giving a tabulation of the work done in this section during the year 1908, and report by Chief Inspector Moran on Public Buildings in the Borough of Brooklyn. These reports give a complete inventory of the number of buildings, with the number of lights in same as closely as they can be fixed, as well as the various changes during the year 1908.

In general, I have to report that up to the end of 1908 no decision had yet been made by the United States Supreme Court in the case of the Consolidated Gas Company against the Public Service Commission and the City, on the ground that the

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price fixed by the laws of 1905 is confiscatory and consequently unconstitutional. Such an opinion is expected early in 1909, but too late to obtain bids on gas for the ensuing year. After the decision of the Supreme Court is handed down, requests for bids for the supply of gas to street lamps and to public buildings will be readvertised.

The affairs of the Bureau of Lamps and Lighting have been continued throughout the year in the usual manner.

The bids received for lighting for the year 1908 were submitted to the Lighting Committee and their recommendations submitted to you, recommending the acceptance of certain bids and the rejection or modification of others. These modifications were usually obtained and contracts made in due course.

One novel element entered the bids of 1908 in two Boroughs, which had not been available previously. This was the bid on Tungsten lamps, either series or multiple, for use in the public parks and streets throughout three Boroughs. This was the result of continued experiment and study of these lamps as applied to street lighting throughout the year 1907. An installation of these lamps was made on Riverside drive, between One Hundred and Second and One Hundred and Twentieth streets, in permanent form, and proved very satisfactory.

On the request of the Commissioner of Parks it is proposed to extend this system and to relight Central Park, Prospect Park and some of the smaller parks.

On account of the success of the series Tungsten lamps in the Borough of Queens it is also planned to extend their use throughout the Borough of The Bronx and in the outside sections of Brooklyn as well as generally throughout the Borough of Richmond. These installations will probably all be made in 1909.

The use of these lamps with large reflectors gives a considerable increase to the actual street illumination, and at the same time has a very agreeable effect.

The Department proposes to adopt the use entirely of 80-watt, nominally 60-candle-power, where incandescent electric lighting is required throughout the greater city. These give a lighting effect in candle-feet on the street, lamp per lamp, on an average of about 50 per cent. more than the average of the mantle gas or naphtha lamp previously in use, and are even more superior when compared with the old 25-candle-power incandescent electric lamps. The Tungsten lamp is also superior in holding its candle power nearly constant to the limit of its life.

These lamps give for the first time, in my opinion, a subdivided electric light strong enough for use in street lighting as a substitute for arc lamps, giving better distribution and a more agreeable effect, particularly on residential streets and in parks and parkways. They can be furnished at a price that for the additional lighting is fairly reasonable.

The price at present is determined entirely by the cost of renewal of the lamp, the lamp itself being quite expensive, costing about $1.25 each for the size given above. This price is going down rapidly, however, and the lamps are being improved in

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making the filament more rugged and making the lamp less subject to breakage from vibration and transportation. In consequence the cost of this lighting in the future should be rather less than more.

An installation of arc lamps was also made on certain main avenues or boulevards in the Boroughs of Manhattan and The Bronx, which have produced excellent results. These installations were made on Broadway, from Fifty-ninth to One Hundred and Twenty-seventh street, and on Seventh avenue, from One Hundred and Tenth street to the end of the avenue.

This installation consists of three arc lamps per block, one on each of two diagonal corners of the block and one in the centre. These lamps are supported by special posts, using bracket posts on the corners, and what is known as a "lyre-top" post on centre plot. These bracket posts were especially designed for this work, in order to throw the light out on the street without shadows from the trees, which in some places are rather heavy on both of these avenues.

The lamps are placed fairly high, about ten (10) feet out from the curb, with diffusing globes. They give a very strong and yet evenly diffused light over the area of the pavement and the street, and the effect has been very much admired by experts in these matters. The effect of long lines of lights is very attractive and the system seems to be generally very satisfactory.

It is proposed during the coming year to extend this system up to One Hundred and Sixty-eighth street and Broadway, as this boulevard has been built up almost solidly to this point and is now used by a great number of people.

The improved lighting on the two avenues mentioned above makes it desirable to increase the lighting on Fifth avenue, particularly as this famous street is now being widened by about fifteen (15) feet from Twenty-fourth to Forty-seventh street. This avenue is at present lighted by twin lamps mounted on one post, two posts per block. The lamps are 250-watt lamps and will not be sufficient for the widened street, and as a matter of fact are not sufficient now, the avenue being very crowded during the evening.

It is proposed to place an additional twin post in the centre of each block and to change all the lamps from 250-watt lamps to 450-watt lamps. Several experiments have been made in this line and proved satisfactory.

Changes are also in contemplation for Madison avenue, particularly below Fifty-ninth street, where there is only one twin arc lamp per block. Above Fifty-ninth street to Seventy-ninth street it is intended to change to twin 450-watt lamps instead of twin 250-watt lamps now installed.

It is further intended to carry the line of arc lighting up the avenue as far as the funds released by the change below Fifty-ninth street will go.

Details of the exact additional work in the year 1908 in the Boroughs of Manhattan and The Bronx are given in General Inspector Quirk's report attached.

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In the Borough of Brooklyn a similar detail of the lamps added will be found in the above report. Since 1907, when a comparatively large amount of money was expended in lighting the Borough of Brooklyn, we have not had such heavy demands on us for additional lights, and outside of the completion of the changes of the lamps of the Kings County Lighting Company, in the Thirtieth Ward, the additional lighting has been principally in extending the lights to streets which were built up during the year.

The major part of the extensions were by means of gas. In the Kings County Lighting Company's district, as you know, an arrangement had been made with the company for a change from open flame lamps to mantle lamps. The change of lamp per lamp was finished in 1907 but the changes in locations of lamps from those where lighting is unnecessary to those of built-up streets that had no light, was finished in the beginning of 1909. Some three hundred (300) lamps were changed in location, and by this means the insistent demands for new lighting in this territory were covered without any additional lamps being ordered throughout the entire year 1908.

The change in general was very satisfactory to the inhabitants of this district and has also been of considerable satisfaction to the company, in that the numerous complaints made against them on street lighting have definitely stopped.

This was one of the most difficult things to negotiate that has arisen in the administration of the Department in some years, and I think the Department can be congratulated in solving the problem so satisfactorily.

In the Borough of Queens the lighting was continued along the same lines as the previous year in endeavoring to light up those sections which for several years had received no attention whatever. The Borough is growing rapidly, caused by development on account of the improved transportation facilities.

The detail of the lighting in this Borough is given in the report of General Inspector Quirk, above mentioned.

The success of the experiment of Tungsten lamps in this territory was such as to cause the rapid extension of this system in the Borough. Where we were able to put up this construction, the result seems to be very satisfactory to the general public, and it will be continued in the future wherever available.

The electric arc lighting in this Borough has also been extended considerably, but unfortunately is not standard with the rest of the City. The lamps are of the 325-watt class, and should be increased to the regular 450-watt. Application for funds for this was made to the Board of Estimate in 1908, for the year 1909, and granted, so that in the coming year arrangements will be made to replace all the 325-watt lamps by the standard 450-watt lamps.

In the Borough of Richmond during the year we were enabled to make an arrangement with the lighting company there, by which they began to improve the lighting in accordance with the requirements of this Department. This occurred about the end

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of June, 1908, and from that time on we began to get somewhat better service from the old equipment. The lighting company ordered the new street lighting appliances required by this Department, but unfortunately, on account of the long delay in obtaining the lamps, the improvements were not completed in the year. This, however, was no fault of the company or of this Department, but a question with the lamp manufacturers as to the requirements of this Department. This, I think, will be successfully met during the next year, and the improvements made.

It is proposed to change the present incandescent lamp of the old carbon type, supposedly 25-candle-power, to 80-watt, 60-candle-power Tungsten lamps, with new reflectors, brackets and so on, all of which will aid in giving us better service than the present equipment. When this is completed there will be a radical change for the better in the lighting of this Borough.

Public buildings are demanding more and more of the attention of the Bureau, and their demands becoming more extensive as well. In order to consistently cover the duties of this Department under the Charter, this Bureau is compelled to act very often as consulting engineer in regard to the specifications and plans of the lighting of these buildings, and also as supervising and inspecting engineer afterwards. This requires a great deal of detail work, and has about reached the limit of capacity of the present force of the Bureau.

In addition to this, the number of public buildings has increased rapidly, and, in my opinion, both the inspection and the engineering force should be increased.

Practically the only inspection of public buildings for the safety of the electrical installation is made by the Inspectors of Lamps and Lighting in this Bureau, in addition to their regular work. This is for the reason that the Electrical Bureau has not sufficient Inspectors to cover this field, which is a most important one, and in consequence until we took up the inspection, the installations in these buildings had deteriorated very greatly. Many of them in some of the older buildings, schools, hospitals and such places, had reached the danger point.

I would unhesitatingly endorse, therefore, the request of the General Inspector for four (4) Inspectors, to be assigned to him for this work. From an engineering standpoint, the illumination of these buildings is steadily improving by the use of improved appliances and methods. The lighting now in each building is carefully calculated, and the plans submitted by the architect revised and changed when necessary to meet the more scientific requirements.

A system of night inspections of buildings as to the lighting, use of gas and current is being made regularly now in the Boroughs of Manhattan, The Bronx and Brooklyn, the inspections being made as often as the number of Inspectors will allow.

The public buildings in Queens and Richmond, formerly small in number and not of as great importance, are rapidly increasing and are becoming larger and demanding more attention. The system should be extended to these two Boroughs, and addi-

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tional Inspectors will be needed for same, as well as additional men to take care of the increase of this work in the Boroughs first mentioned.

We are also trying to devise methods by which we can get more care and attention given the use of lighting and appliances by the other Departments, in order to obtain more economy and avoid needless expense in their use. This is a difficult thing to do, and I regret to say that up to date has not been solved in a practical way.

So far as the street lighting is concerned, it is comparatively easy to show the benefits of a well organized inspection force that really inspects. In public buildings, however, the benefit of the inspection and the planning of illumination, and so on, cannot be shown in any concrete way. Yet at the same time considerable saving has been made, in preventing the installation of appliances and methods which would prove wasteful.

In this regard, on account of the change in rates since 1905, both in the cost of gas and electricity, the cost of current from supplying companies to the great majority of public buildings has reached a point which can not be decreased under the present form of government by the installation of small City plants in individual buildings, and consequently I would strongly recommend that this procedure be discontinued, except in very special instances. It involves an expense in the first cost, as well as an increased cost of lighting extending over a long period and involving the expenditure of large sums of money quite unnecessarily. This has been demonstrated quite thoroughly by tests of plants which this Bureau has made in connection with the Department of Finance during the past year. The figures, which are open to any one's inspection, prove conclusively that in nearly all instances the costs on which the recommendations for a plant are based are not found to be true in practice, that ordinarily there is far less use of current from the plant than is originally figured. A small consumption from a large capacity installed means a higher cost per kilowatt hour than is originally calculated on.

In several instances of this character, the actual cost of current per kilowatt hour exceeded the rate for which it could be purchased by from five to eight (5 to 8) cents. The double waste of money caused by this error should be stopped.

## Bureau of Electrical Inspection.

Early in October of this year you placed the Bureau of Electrical Inspection under my charge. After careful examination, I reported to you that I found the Bureau in a very serious and inefficient condition. I found that the five officers of this Bureau in the five Boroughs were each operating on a different system, without any particular co-operation with each other or any standard method of doing business. I found that the greater part of the time of the Inspectors of the Bureau was taken up by small routine inspections of ordinary buildings and stores, involving practically nothing but a fire risk, and that not enough attention was given to the theatres and

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places of public assemblage, where there is life and panic hazard as well as a fire hazard.

In a way this Bureau is responsible for the electrical safety of all the buildings in the greater City. In other words, the installations put in must be installed in accordance with the rules of the Bureau, based practically on the rules of the National Board of Fire Underwriters, although differing in certain details.

In two of the Bureaus, at any rate, particularly The Bronx and Richmond, the inspection force was very much too small for the work. I found that the Inspectors, Clerks and so on had apparently lost interest and were plodding along in the routine method with no particular ambition or wish to improve conditions. The only Bureau that was run on an efficient basis under the limits of the Bureau as existing at that time was the Brooklyn office. The Queens and Richmond offices were doing as good work as they could with their limited facilities and lack of any practical connection with the main office of the Department.

I found appliances were being submitted by various manufacturers for approval, principally to the Manhattan office on account of its being the largest, and that the method of approving or disapproving these appliances was greatly at fault, was creating, in general, great dissatisfaction to all concerned, and the reputation of the Bureau and the Department was suffering accordingly.

Professor Sever of Columbia University was Consulting Engineer for this Bureau, as well as for Lamps and Lighting, and yet, as nearly as I can tell, he was rarely consulted, except by the Commissioners or the Brooklyn office, and reports he made were pigeonholed in the Manhattan office itself, if so desired.

A complete and radical reorganization was absolutely necessary on a broad plan, and I took this matter up with the people most concerned, namely, the electrical contractors, the electric lighting companies, the manufacturers, the Board of Underwriters and the Engineer and Chief Inspectors of the various Borough offices. In consequence, the following action was taken:

The approval of all appliances was immediately referred to Columbia University under their contract with the City, and these appliances are now approved or disapproved formally; first by the University and then by the three Engineers connected with the Bureau, and their findings are certified to you for final approval. This relieves any question as to any bias or prejudice on the part of the Department, its officers or Engineers, and gives as a fundamental basis for the Department to stand on the tests of Columbia University.

Since this has been put in force I have had no complaints of any character in regard to this point, and it has been unnecessary to carry any points for decision, between the applicant and the Department, beyond your Advisory Board of Engineers. This Board was made up of the Chief Engineer of Light and Power, the Consulting Engineer and the Electrical Engineer in charge of the Brooklyn office of this Bureau.

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The Electrical Engineer formerly in charge of the Brooklyn office was brought to the New York office, and a headquarters system organized by which he was placed in charge, as my assistant, of the work of the Bureau in each of the five Boroughs. The general reorganization of the office methods and inspection methods was planned and is being carried out as far as possible at this time. Each of the offices in each Borough now receives immediate information of the decisions made by the Board of Engineers, and is also advised immediately as to each certification of appliances by Columbia University, this Board and yourself.

In consequence, similar requirements are called for in each Borough, and there is no longer the confusion among the contractors, when in one Borough they were compelled to do certain things and in another Borough they were not.

This plan has also worked well and seems to have given immediate relief and satisfaction. In this way, you will note, we have practically eliminated the discord and criticism and gotten down to the action of the Inspector and his dealings with the public. This was rather more of a problem than the rest of it, as there were not enough Inspectors to do the work properly and rapidly under the reorganization as planned, and would have required a greatly increased force at a large expense.

One of the greatest causes of dissatisfaction to the general public, as well as to the contractors, electric lighting companies and so on, was the fact that for each electrical installation there had to be two inspections made before the current could be turned on; one, wherever fire insurance was desired, by the inspectors of the Board of Fire Underwriters, and, in addition, they had to inspect many buildings which were not insured, but which involved the safety of those that were. This Department also had to make an inspection. Two certificates had to be given, and the requirements of the Board and this Department were not similar.

On account of lack of men, in certain Boroughs particularly, the Department was utterly unable to handle the work properly, and considerable delay in certifications, and consequent delay in turning on the current, occurred all over the City.

It was found on investigation that there were seventy-one (71) employees available in all five Boroughs, and to properly do this work it would require one hundred and twenty-one (121). Of the existing employees, forty-four (44) were Inspectors, whereas eighty-four (84) would be required to properly cover the work.

In order to meet this, the following plan was finally evolved and submitted to all parties in interest about the end of the year:

At the conference held between the electrical interests, the Board of Fire Underwriters and the Engineers of this Department, the representatives of the electrical industry requested, above all things, that, if possible, some plan be adopted which would obviate the necessity of getting two certificates for each installation.

This Department was anxious to use the larger number of its Inspectors on work covering the panic and death hazard, as well as the fire hazard.

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It was proposed by your Engineers, therefore, that if proper under the Charter as interpreted by the Corporation Counsel, this Department make an agreement with the Board of Fire Underwriters, if possible both the New York Board and the National Board, by which they would assume the routine inspections and certifications of ordinary fire hazards, under the supervision of this Department and with this Department's endorsement on each of their certificates.

A proposition of this kind, involving certain conditions desirable to the Underwriters and others desirable to the City, was finally made by you to the New York Board of Fire Underwriters, after approval of the Corporation Counsel, and was accepted by them very recently.

It is proposed therefore, in the territory covered by this Board, that we relinquish our inspections, except in so far as it is necessary to follow up the work that the underwriters are doing, in order to check same from time to time, and devote the energies of our Inspectors to places of public assemblage, public buildings and similar installations.

Public buildings will take considerable time until their present deplorable condition is improved, and then will not require so much attention provided they are inspected at regular intervals.

In places of public assemblage, such as theatres, churches, moving picture shows, political halls and so on, it is proposed to organize a special squad of a number of men in each borough, who will inspect these places in succession, at as frequent intervals as possible, and make specific reports on their condition, these inspections to be followed by the Chief Inspectors, and carefully reported, checked and recorded by the Engineers of the Department. The Engineers will also make inspections of these buildings, particularly in case of dispute, and in any event as often as they are able to through the year.

By holding such buildings to the strict rules of the underwriters and the City, which are now to be made uniform, filing careful reports of their condition, it is hoped to minimize the life and panic hazard as much as possible, and in any event put a record behind the Department in each instance which will show that all that the Department could do was done to prevent accidents.

The several instances we have already brought up to you for enforcement in the case of moving picture shows, one or two theatres and certain public buildings, have proved to you, I believe, the risk always involved in buildings of this character, and show the necessity of careful inspection and a strict compliance with the electrical rules.

Recently the proposed plan of reorganization has been submitted to you, and is now before the Board of Aldermen and the Board of Estimate for approval.

I gladly call attention to the valuable services and aid given me in this work by Professor Sever, both in his connection with the Department as Consulting Electrical Engineer and his position as Professor of Electricity in Columbia University, in charge

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of the testing work for the City. This has entailed a large amount of extra work, both to the University and himself, for which no remuneration can be provided this year.

I am also glad to advise you that Mr. Wynkoop has actively and efficiently carried to a successful conclusion the reorganization of the Bureau on the lines laid out, so far as it could be concluded to date, and his services in this matter should also be fully recognized.

You will note that in regard to the Electrical Bureau I have passed beyond what really happened in 1908, and have gone practically into an advance report of what has happened up to date in 1909. This is due to the fact that I regard this reorganization of great importance in minimizing certain dangers always present in public buildings, whether City or private, due possibly to careless use of electric current and appliances.

To my mind, the Charter clearly puts on this Department the responsibility of conditions of electrical safety throughout the City, and, in my opinion, the Department has not been, up to date, in a condition to properly perform these duties.

I am using every effort to forward the reorganization, and trust that it may be speedily accomplished in order to relieve us all from an ever present anxiety.

All of which is respectfully submitted.

C. F. LACOMBE, Chief Engineer of Light and Power.

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## REPORT OF CONSULTING ELECTRICAL ENGINEER.

Office of Consulting Electrical Engineer,
Nos. 13 to 21 Park Row,
New York, June 17, 1909.

Hon. JOHN H. O'BRIEN, Commissioner:

Dear Sir—At the request of Mr. C. F. Lacombe, I transmit herewith report for the year 1908, on electric meters tested for The City of New York under the contract of your Department with Columbia University.

Respectfully,

G. F. SEVER.

Meters Tested from January 1 to December 31, 1908.

Alternating Current.

| | Light Load. | Full Load. |
|---|---|---|
| Number tested | 41 | 46 |
| Average error, per cent | —3.31 | +0.646 |
| Average registration, per cent | 96.69 | 100.646 |

Direct Current.

| | Light Load. | Full Load. |
|---|---|---|
| Number tested | 205 | 206 |
| Average error, per cent | —2.72 | —1.065 |
| Average registration, per cent | 97.28 | 98.935 |

Two hundred and fifty-two meters tested.

Electric Meter Tests from January 1 to December 31, 1908.

Light Load.

| Fast 4 Per Cent. | | Slow 4 Per Cent. | |
|---|---|---|---|
| A. C. meters | .. | A. C. meter | 1 |
| D. C. meters | 3 | D. C. meter | 1 |

Full Load.

| Fast 4 Per Cent. | | Slow 4 Per Cent. | |
|---|---|---|---|
| A. C. meter | 1 | A. C. meters | .. |
| D. C. meter | 1 | D. C. meters | 3 |

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Tabulation of Electric Meter Tests for Department of Water Supply, Gas-and Electricity of New York City, from January 1 to December 31, 1908.

Full Load.

| Per Cent. Variation. | Number Fast. | Per Cent. of Total. | Number Slow. | Per Cent. of Total. | Number O. K. | Per Cent. of Total. | Total. |
|---|---|---|---|---|---|---|---|
| 0 | .. | ..... | .. | ..... | 2 | 0.794 | ..... |
| 0-1 | 44 | 17.45 | 34 | 13.5 | .. | ..... | ..... |
| 1 2 | 29 | 11.5 | 38 | 15.07 | .. | ..... | ..... |
| 2-3 | 13 | 5.17 | 14 | 5.56 | .. | ..... | ..... |
| 3-4 | 14 | 5.56 | 14 | 5.56 | .. | ..... | ..... |
| 4-5 | 5 | 1.985 | 6 | 2.38 | .. | ..... | ..... |
| 5-6 | 6 | 2.38 | 3 | 1.19 | .. | ..... | ..... |
| 6-7 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| 7-8 | 6 | 2.38 | 4 | 1.587 | .. | ..... | ..... |
| 8-9 | 1 | 0.397 | 2 | 0.794 | .. | ..... | ..... |
| 9-10 | 1 | 0.397 | 1 | 0.397 | .. | ..... | ..... |
| 11-12 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| 12-13 | 1 | 0.397 | 1 | 0.397 | .. | ..... | ..... |
| 13-14 | 1 | 0.397 | 1 | 0.397 | .. | ..... | ..... |
| 15-16 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| 16-17 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| 18-19 | 1 | 0.397 | .. | ..... | .. | ..... | ..... |
| 19-20 | 1 | 0.397 | .. | ..... | .. | ..... | ..... |
| 27-28 | .. | ..... | 2 | 0.794 | .. | ..... | ..... |
| 30-31 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| 32-33 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| 100 | .. | ..... | 1 | 0.397 | .. | ..... | ..... |
| | 123 | | 127 | | 2 | | 252 |

2 or .79 per cent. O. K.
200 or 79.4 per cent., 4 per cent. slow and less than 4 per cent. fast.
23 or 9.12 per cent., over 4 per cent. slow.
27 or 10.7 per cent., 4 per cent. or over fast.

252 or 100.00 per cent. tested.

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## Light Load.

| Per Cent. Variation. | Number Fast. | Per Cent. of Total. | Number Slow. | Per Cent. of Total. | Number O. K. | Per Cent. of Total. | Total. |
|---|---|---|---|---|---|---|---|
| 0 | .. | ..... | .. | ..... | 7 | 2.85 | ..... |
| 0-1 | 32 | 13.0 | 28 | 11.4 | .. | ..... | ..... |
| 1-2 | 24 | 9.76 | 21 | 8.54 | .. | ..... | ..... |
| 2-3 | 13 | 5.28 | 12 | 4.88 | .. | ..... | ..... |
| 3-4 | 9 | 3.66 | 12 | 4.88 | .. | ..... | ..... |
| 4-5 | 10 | 4.07 | 13 | 5.28 | .. | ..... | ..... |
| 5-6 | .. | ..... | 6 | 2.44 | .. | ..... | ..... |
| 6-7 | 4 | 1.626 | 5 | 2.03 | .. | ..... | ..... |
| 7-8 | 1 | 0.407 | 5 | 2.03 | .. | ..... | ..... |
| 8-9 | 1 | 0.407 | 3 | 1.22 | .. | ..... | ..... |
| 9-10 | 1 | 0.407 | 4 | 1.626 | .. | ..... | ..... |
| 10-11 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 11-12 | 4 | 1.626 | 1 | 0.407 | .. | ..... | ..... |
| 12-13 | 1 | 0.407 | 2 | 0.814 | .. | ..... | ..... |
| 14-15 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 15-16 | .. | ..... | 2 | 0.814 | .. | ..... | ..... |
| 16-17 | .. | ..... | 3 | 1.22 | .. | ..... | ..... |
| 18-19 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 19-20 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 20-21 | 1 | 0.407 | 2 | 0.814 | .. | ..... | ..... |
| 22-23 | 1 | 0.407 | 1 | 0.407 | .. | ..... | ..... |
| 23-24 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 24-25 | 1 | 0.407 | .. | ..... | .. | ..... | ..... |
| 27-28 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 28-29 | 1 | 0.407 | .. | ..... | .. | ..... | ..... |
| 38-39 | 1 | 0.407 | .. | ..... | .. | ..... | ..... |
| 40-41 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 43-44 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 44-45 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 52-53 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 63-64 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |

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| Per Cent. Variation. | Number Fast. | Per Cent. of Total. | Number Slow. | Per Cent. of Total. | Number O. K. | Per Cent. of Total. | Total. |
|---|---|---|---|---|---|---|---|
| 66-67 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 78-79 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| 100 | .. | ..... | 1 | 0.407 | .. | ..... | ..... |
| | 105 | | 134 | | 7 | | 246 |
| Not tested at light load | | | | | | | 6 |
| Grand total | | | | | | | 252 |

7 or 2.84 per cent. O. K.
151 or 61.5 per cent., 4 per cent. slow and less than 4 per cent. fast.
61 or 24.8 per cent., over 4 per cent. slow.
27 or 11.00 per cent., 4 per cent. or over fast.

246 or 100.00 per cent. tested.

Classification of Electrical Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1, 1908, to December 31, 1908, on the System of the New York Edison Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| Over 4 per cent. fast | 25 | 12.95 | 15 | 7.7 |
| 4 per cent. slow and not over 4 per cent. fast | 120 | 62.2 | 155 | 80.0 |
| Over 4 per cent. slow | 48 | 24.85 | 24 | 12.3 |
| Total tested | 193 | 100.00 | 194 | 100.00 |
| Not tested | 1 | ..... | ..... | ..... |
| Total | 194 | 100.00 | 194 | 100.00 |

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Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of the United Electric Light and Power Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. or over fast | 1 | 3.7 | 2 | 7.4 |
| 4 per cent. slow and not over 4 per cent. fast | 21 | 77.8 | 24 | 88.9 |
| Over 4 per cent. slow | 5 | 18.5 | 1 | 3.7 |
| Total | 27 | 100.00 | 27 | 100.00 |

Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of the Brooklyn Edison Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. or over fast | .. | ..... | .. | ..... |
| 4 per cent. slow and not over 4 per cent. fast | 6 | 100.00 | 8 | 100.00 |
| Over 4 per cent. slow | .. | ..... | .. | ..... |
| Total tested | 6 | 100.00 | 8 | 100.00 |
| Not tested | 2 | ..... | .. | ..... |
| Total | 8 | 100.00 | 8 | 100.00 |

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Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of New York and Queens Electric Light and Power Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. or over fast | .. | ..... | .. | ..... |
| 4 per cent. slow and not over 4 per cent. fast | 5 | 100.00 | 7 | 100.00 |
| Over 4 per cent. slow | .. | ..... | .. | ..... |
| Total tested | 5 | 100.00 | 7 | 100.00 |
| Not tested | 2 | ..... | .. | ..... |
| Total | 7 | 100.00 | 7 | 100.00 |

Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of the Queens Borough Gas and Electric Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. or over fast | .. | ..... | .. | ..... |
| 4 per cent. slow and not over 4 per cent. fast | 1 | 50.00 | 3 | 100.00 |
| Over 4 per cent. fast | 1 | 50.00 | .. | ..... |
| Total tested | 2 | 100.00 | 3 | 100.00 |
| Not tested | 1 | ..... | .. | ..... |
| Total | 3 | 100.00 | 3 | 100.00 |

Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of the Richmond Light and Railroad Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. or over fast | .. | ..... | .. | ..... |
| 4 per cent. slow and not over 4 per cent. fast | 1 | 50.00 | 2 | 100.00 |
| Over 4 per cent. slow | 1 | 50.00 | .. | ..... |
| Total | 2 | 100.00 | 2 | 100.00 |

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Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of the Flatbush Gas Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. or over fast..... | .. | ..... | .. | ..... |
| 4 per cent. slow and not over 4 per cent. fast.. | 1 | 100.00 | 1 | 100.00 |
| Over 4 per cent. slow..... | .. | ..... | .. | ..... |
| Total..... | 1 | 100.00 | 1 | 100.00 |

Classification of Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1 to December 31, 1908, on the System of the Engineering Supervision Company.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. and over fast..... | 1 | 14.28 | 2 | 28.56 |
| 4 per cent. slow and not over 4 per cent. fast.. | 3 | 42.86 | 4 | 57.16 |
| Over 4 per cent. slow..... | 3 | 42.86 | 1 | 14.28 |
| Total..... | 7 | 100.00 | 7 | 100.00 |

Classification of Miscellaneous Electric Meters Tested by Columbia University for Department of Water Supply, Gas and Electricity, New York City, from January 1, 1908, to December 31, 1908.

| Class. | Light Load. | | Full Load. | |
|---|---|---|---|---|
| | Number. | Per Cent. | Number. | Per Cent. |
| 4 per cent. and over fast..... | 2 | 66.6 | 2 | 66.6 |
| 4 per cent. slow and not over 4 per cent. fast.. | .. | ..... | .. | ..... |
| Over 4 per cent. slow..... | 1 | 33.3 | 1 | 33.3 |
| Total..... | 3 | 100.00 | 3 | 100.00 |

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Tabulation of Results of Electric Meter Testing for Department of Water
December

| Operating Company. | Test Number. |
|---|---|
| January, 1908— | |
| New York Edison Company | 128 |
| New York Edison Company | 129 |
| New York Edison Company | 130 |
| New York Edison Company | 131 |
| New York Edison Company | 132 |
| United Electric Light and Power Company | 133 |
| United Electric Light and Power Company | 134 |
| New York Edison Company | 135 |
| New York Edison Company | 136 |
| Queens Gas and Electric Company | 137 |
| Queens Gas and Electric Company | 138 |
| New York Edison Company | 139 |
| New York Edison Company | 140 |
| New York Edison Company | 141 |
| New York Edison Company | 142 |
| New York Edison Company | 143 |
| New York Edison Company | 144 |
| New York Edison Company | 145 |
| New York Edison Company | 146 |
| New York Edison Company | 147 |
| New York Edison Company | 148 |
| New York Edison Company | 149 |
| New York Edison Company | 150 |
| United Electric Light and Power Company | 151 |
| United Electric Light and Power Company | 152 |
| New York Edison Company | 153 |
| New York Edison Company | 154 |
| United Electric Light and Power Company | 155 |
| United Electric Light and Power Company | 156 |
| New York Edison Company | 157 |
| United Electric Light and Power Company | 158 |
| United Electric Light and Power Company | 159 |
| United Electric Light and Power Company | 160 |

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Supply, Gas and Electricity by Columbia University, New York, January 1, 1908, to 31, 1908.

| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 10 | 240 | 2 | 32.90 | 1.10 | .... | 101.90 | 1.20 | .... |
| 50 | 240 | 2 | 51.60 | .... | 1.90 | 113.00 | .... | 4.10 |
| 15 | 240 | 3 | 9.10 | .... | 3.10 | 100.80 | .... | 5.25 |
| 5 | 240 | 2 | 50.80 | 4.10 | .... | 95.50 | 2.30 | .... |
| 5 | 120 | 2 | 13.40 | .... | 6.90 | 97.70 | .... | 4.40 |
| 10 | 200 | 3 | 10.00 | 1.00 | .... | 100.00 | 1.60 | 1.25 |
| 10 | 200 | 3 | 10.00 | O. K. | .... | 100.00 | .... | 1.25 |
| 50 | 240 | 3 | 10.20 | 2.00 | .... | 102.20 | 0.70 | .... |
| 7.5 | 240 | 3 | 11.86 | .... | 8.20 | 98.10 | 0.50 | .... |
| 10 | 100 | 2 | 13.26 | .... | 1.40 | 118.60 | 0.30 | .... |
| 200-2$\phi$ | 400 | 4 | .... | .... | .... | 106.00 | 8.15 | .... |
| 15 | 240 | 3 | 10.62 | .... | 2.00 | 73.30 | .... | 1.90 |
| 15 | 240 | 3 | 10.62 | .... | 41.00 | 97.80 | .... | 7.30 |
| 25 | 240 | 3 | 11.81 | 1.00 | .... | 100.67 | 3.70 | .... |
| 15 | 240 | 2 | 10.10 | 3.00 | .... | 100.10 | 3.20 | .... |
| 50 | 240 | 2 | 10.15 | 1.00 | .... | 100.30 | 2.00 | .... |
| 50 | 240 | 3 | 10.26 | O. K. | .... | 99.90 | 1.00 | .... |
| 5 | 120 | 2 | 8.33 | .... | 9.10 | 103.00 | 0.70 | .... |
| 3.5 | 240 | 3 | 12.54 | .... | 9.20 | 97.70 | 0.90 | .... |
| 10 | 240 | 3 | 12.26 | 2.00 | .... | 100.50 | 4.10 | .... |
| 25 | 240 | 2 | 10.20 | 4.00 | .... | 100.60 | 1.40 | .... |
| 15 | 240 | 3 | 11.17 | .... | 4.70 | 103.10 | .... | 0.60 |
| 7.5 | 40 | 3 | 11.97 | .... | 8.00 | 95.89 | .... | 6.90 |
| 10 | 200 | 3 | 13.14 | .... | 78.30 | 104.10 | .... | 3.25 |
| 40-2$\phi$ | 200 | 3 | 10.00 | .... | 0.05 | 100.00 | 3.30 | .... |
| 10 | 240 | 3 | 12.08 | .... | 52.10 | 85.75 | .... | 27.70 |
| 5 | 240 | 3 | 8.29 | 6.60 | .... | 101.70 | 2.30 | .... |
| 10 | 100 | 2 | 12.54 | O. K. | .... | 107.90 | .... | 1.10 |
| 40-2$\phi$ | 200 | 3 | 10.00 | .... | 63.87 | 100.00 | .... | 5.70 |
| 25 | 240 | 3 | 10.40 | .... | 2.80 | 100.50 | .... | 7.80 |
| 5 | 200 | 3 | 10.34 | 3.00 | .... | 104.00 | 1.90 | .... |
| 40-2$\phi$ | 200 | 3 | 10.00 | 0.75 | .... | 100.00 | 0.80 | .... |
| 10 | 100 | 2 | 12.86 | 3.50 | .... | 109.00 | .... | 0.50 |

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| Operating Company. | Test Number. |
|---|---|
| January, 1908— | |
| New York Edison Company | 161 |
| New York Edison Company | 162 |
| New York Edison Company | 163 |
| United Electric Light and Power Company | 164 |
| New York Edison Company | 165 |
| New York Edison Company | 166 |
| New York Edison Company | 167 |
| New York Edison Company | 168 |
| United Electric Light and Power Company | 169 |
| New York Edison Company | 170 |
| New York Edison Company | 171 |
| New York Edison Company | 172 |
| February, 1908— | |
| New York Edison Company | 173 |
| New York Edison Company | 174 |
| New York Edison Company | 175 |
| New York Edison Company | 176 |
| New York Edison Company | 177 |
| New York Edison Company | 178 |
| New York Edison Company | 179 |
| New York Edison Company | 180 |
| New York Edison Company | 181 |
| New York Edison Company | 182 |
| New York Edison Company | 183 |
| Brooklyn Edison Company | 184 |
| New York Edison Company | 185 |
| Queens Gas and Electric Company | 186 |
| New York Edison Company | 187 |
| New York Edison Company | 188 |
| New York Edison Company | 189 |
| New York Edison Company | 190 |
| New York Edison Company | 191 |
| Richmond Power Company | 192 |
| New York Edison Company | 193 |
| New York Edison Company | 194 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 3.5 | 240 | 3 | 12.26 | .... | 1.10 | 94.10 | .... | 4.70 |
| 50 | 240 | 2 | 9.84 | 3.80 | .... | 100.80 | 5.30 | .... |
| 15 | 240 | 3 | 10.60 | 1.70 | .... | 81.50 | .... | 2.00 |
| 5 | 200 | 3 | 10.63 | O. K. | .... | 107.20 | 0.60 | .... |
| 75 | 240 | 3 | 10.15 | .... | 6.75 | 100.00 | .... | 2.20 |
| 25 | 240 | 2 | 10.00 | 11.30 | .... | 100.60 | 13.70 | .... |
| 150 | 240 | 3 | 9.99 | .... | 6.70 | 83.33 | .... | 1.00 |
| 100 | 240 | 2 | 9.88 | .... | 3.10 | 98.80 | .... | 1.80 |
| 10 | 200 | 3 | 12.07 | O. K. | .... | 69.50 | 5.10 | .... |
| 10 | 120 | 2 | 10.16 | .... | 11.60 | 99.75 | .... | 0.60 |
| 10 | 240 | 3 | 10.20 | .... | 1.80 | 100.25 | .... | 7.75 |
| 15 | 240 | 3 | 11.26 | .... | 7.30 | 92.90 | .... | 4.20 |
| 10 | 240 | 3 | 10.34 | .... | 0.70 | 100.75 | .... | 3.20 |
| 25 | 240 | 2 | 10.30 | 3.30 | .... | 100.50 | .... | 3.10 |
| 5 | 240 | 3 | 9.77 | .. . | 0.70 | 94.17 | .... | 0.40 |
| 15 | 240 | 3 | 9.93 | 0.80 | .... | 99.40 | 0.70 | .... |
| 15 | 240 | 3 | 9.85 | .... | 1.80 | 100.30 | .... | 27.10 |
| 15 | 240 | 3 | 9.55 | .... | 1.00 | 97.70 | 0.05 | .... |
| 25 | 240 | 2 | 10.29 | 7.00 | .... | 99.00 | 3.00 | .... |
| 75 | 240 | 3 | 10.17 | .... | 4.00 | 93.57 | 3.70 | .... |
| 25 | 240 | 3 | 10.75 | .... | 3.40 | 95.53 | .... | 2.20 |
| 25 | 240 | 3 | 9.53 | 1.80 | .... | 77.10 | .... | 4.00 |
| 75 | 240 | 2 | 9.86 | 1.00 | .... | 96.74 | .... | 2.90 |
| 10 | 230 | 3 | 8.18 | 0.70 | .... | 78.50 | .... | 0.90 |
| 25 | 240 | 2 | 10.35 | .... | 0.90 | 102.17 | 0.20 | .... |
| 15 | 110 | 2 | 12.36 | .... | 4.45 | 99.75 | .... | 1.30 |
| 5 | 240 | 3 | 12.25 | .... | 3.80 | 100.42 | .... | 3.90 |
| 10 | 240 | 2 | 72.60 | .... | 16.30 | 97.35 | .... | 9.40 |
| 15 | 240 | 3 | 8.73 | 4.50 | .... | 95.00 | 1.60 | .... |
| 5 | 240 | 2 | 70.20 | 6.10 | .... | 91.20 | 3.60 | .... |
| 5 | 240 | 3 | 9.53 | 2.80 | .... | 90.90 | 2.90 | .... |
| 10 | 110 | 2 | 13.64 | .... | 12.20 | 99.80 | .... | 1.50 |
| 10 | 240 | 3 | 10.69 | 2.60 | .... | 85.20 | 4.40 | .... |
| 50 | 240 | 3 | 10.67 | 5.00 | .... | 106.70 | 7.60 | .... |

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| Operating Company. | Test Number. |
|---|---|
| February, 1908— | |
| New York Edison Company | 195 |
| United Electric Light and Power Company | 196 |
| New York Edison Company | 197 |
| New York Edison Company | 198 |
| New York Edison Company | 199 |
| New York Edison Company | 200 |
| New York Edison Company | 201 |
| Brooklyn Edison Company | 202 |
| March, 1908— | |
| New York Edison Company | 203 |
| New York Edison Company | 204 |
| New York Edison Company | 205 |
| New York Edison Company | 206 |
| New York Edison Company | 207 |
| Engineering Supervision Company | 208 |
| Engineering Supervision Company | 209 |
| Engineering Supervision Company | 210 |
| Engineering Supervision Company | 211 |
| Engineering Supervision Company | 212 |
| New York Edison Company | 213 |
| New York Edison Company | 214 |
| New York Edison Company | 215 |
| New York Edison Company | 216 |
| New York Edison Company | 217 |
| New York Edison Company | 218 |
| New York Edison Company | 219 |
| New York Edison Company | 220 |
| New York Edison Company | 221 |
| New York Edison Company | 222 |
| New York Edison Company | 223 |
| United Electric Light and Power Company | 224 |
| United Electric Light and Power Company | 225 |
| New York Edison Company | 226 |
| New York Edison Company | 227 |
| New York Edison Company | 228 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 15 | 240 | 3 | 10.88 | .... | 0.80 | 98.00 | .... | 2.20 |
| 20 | 200 | 3 | 10.00 | 4.90 | .... | 100.00 | 4.10 | .... |
| 15 | 240 | 2 | 18.84 | .... | 4.70 | 99.50 | .... | 4.00 |
| 15 | 240 | 2 | 66.80 | 2.00 | .... | 100.00 | 1.40 | .... |
| 100 | 240 | 3 | 10.16 | 0.10 | .... | 99.20 | .... | 0.30 |
| 7.5 | 240 | 3 | 11.92 | .... | 1.60 | 99.78 | 0.60 | .... |
| 25 | 240 | 3 | 9.88 | .... | 44.00 | 97.70 | .... | 30.10 |
| 25 | 230 | 3 | 9.08 | .... | 0.50 | 103.80 | .... | 0.40 |
| 15 | 240 | 3 | 9.57 | 2.80 | .... | 97.30 | .... | 0.20 |
| 5 | 240 | 3 | 8.57 | .... | 4.20 | 98.10 | .... | 2.00 |
| 450 | 120 | 2 | 10.20 | .... | 2.50 | 94.00 | .... | 3.90 |
| 15 | 240 | 3 | 9.55 | .... | 12.20 | 89.50 | .... | 1.80 |
| 100 | 240 | 2 | 9.66 | 11.20 | .... | 50.75 | 6.00 | .... |
| 25 | 220 | 3 | 9.83 | .... | 44.75 | 81.60 | .... | 32.50 |
| 25 | 220 | 3 | 10.25 | .... | 4.75 | 82.40 | 0.90 | .... |
| 15 | 240 | 3 | 9.52 | 0.40 | .... | 96.00 | 7.70 | .... |
| 25 | 220 | 3 | 10.10 | .... | 0.10 | 81.80 | 1.10 | .... |
| 10 | 120 | 2 | 10.26 | .... | 0.10 | 103.00 | .... | 0.40 |
| 40 | 200 | 3 | 10.10 | 0.60 | .... | 101.90 | .... | 0.90 |
| 15 | 240 | 3 | 9.87 | 4.00 | .... | 101.40 | .... | 1.70 |
| 50 | 240 | 3 | 10.60 | .... | 0.15 | 100.00 | .... | 1.60 |
| 15 | 240 | 2 | 50.40 | 1.00 | .... | 101.60 | .... | 0.30 |
| 5 | 240 | 3 | 8.57 | .... | 19.10 | 100.50 | .... | 2.30 |
| 3 | 120 | 2 | 14.04 | .... | 0.60 | 101.10 | .... | 1.10 |
| 50 | 240 | 2 | 48.80 | .... | 5.30 | 98.50 | .... | 5.50 |
| 15 | 240 | 3 | 9.90 | .... | 2.00 | 104.20 | .... | 4.70 |
| 15 | 240 | 3 | 10.80 | .... | 3.10 | 93.00 | .... | 1.70 |
| 15 | 240 | 3 | 10.70 | .... | 20.90 | 96.80 | .... | 16.70 |
| 450 | 120 | 2 | 10.25 | .... | 2.50 | 95.50 | .... | 1.50 |
| 10 | 100 | 2 | 10.00 | O. K. | .... | 100.00 | .... | 0.40 |
| 80 | 100 | 2 | 10.00 | .... | 3.10 | 100.00 | .... | 1.20 |
| 10 | 240 | 3 | 9.82 | .... | 3.00 | 98.50 | .... | 2.00 |
| 100 | 240 | 3 | 10.18 | .... | 1.30 | 101.40 | 0.35 | .... |
| 15 | 240 | 3 | 10.60 | 6.10 | .... | 100.70 | 0.50 | .... |

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| Operating Company. | Test Number. |
|---|---|
| **March, 1908—** | |
| United Electric Light and Power Company | 229 |
| United Electric Light and Power Company | 230 |
| New York Edison Company | 231 |
| New York Edison Company | 232 |
| New York Edison Company | 233 |
| New York Edison Company | 234 |
| New York Edison Company | 235 |
| New York Edison Company | 236 |
| New York Edison Company | 237 |
| New York Edison Company | 238 |
| United Electric Light and Power Company | 239 |
| New York Edison Company | 240 |
| New York Edison Company | 241 |
| New York Edison Company | 242 |
| New York Edison Company | 243 |
| New York Edison Company | 244 |
| New York Edison Company | 245 |
| New York Edison Company | 246 |
| New York Edison Company | 247 |
| New York Edison Company | 248 |
| New York Edison Company | 249 |
| New York Edison Company | 250 |
| New York Edison Company | 251 |
| New York Edison Company | 252 |
| New York Edison Company | 253 |
| New York Edison Company | 254 |
| United Electric Light and Power Company | 255 |
| New York Edison Company | 256 |
| New York Edison Company | 257 |
| New York Edison Company | 258 |
| United Electric Light and Power Company | 259-A |
| United Electric Light and Power Company | 260-A |
| **April, 1908—** | |
| New York Edison Company | 261 |
| New York Edison Company | 262 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 40–2$\phi$ | 200 | 3 | 10.00 | .... | 0.10 | 100.00 | .... | 0.20 |
| 10–2$\phi$ | 200 | 3 | 10.00 | O. K. | .... | 100.00 | 1.70 | .... |
| 25 | 240 | 3 | 10.66 | .... | 1.30 | 101.30 | .... | 0.60 |
| 7–½ | 240 | 3 | 10.48 | 4.20 | .... | 92.90 | 3.10 | .... |
| 15 | 240 | 3 | 8.52 | 1.90 | .... | 97.50 | .... | 0.30 |
| 3–½ | 240 | 3 | 11.90 | .... | 3.20 | 97.00 | 3.40 | .... |
| 25 | 240 | 3 | 10.85 | 0.10 | .... | 100.60 | .... | 0.60 |
| 25 | 240 | 3 | 10.33 | 0.20 | .... | 99.83 | 1.00 | .... |
| 50 | 240 | 3 | 9.62 | .... | 5.30 | 98.10 | .... | 4.40 |
| 75 | 240 | 2 | 6.56 | 20.50 | .... | 102.00 | .... | 3.50 |
| 20 | 200 | 3 | 10.00 | 0.80 | .... | 100.00 | 0.20 | .... |
| 25 | 240 | 3 | 10.60 | .... | 1.90 | 96.80 | .... | 2.50 |
| 75 | 240 | 2 | 46.90 | 1.50 | .... | 99.75 | 1.70 | .... |
| 5 | 240 | 3 | 7.79 | 1.10 | .... | 94.80 | .... | 1.20 |
| 50 | 240 | 3 | 10.35 | .... | 1.50 | 100.75 | 0.70 | .... |
| 25 | 240 | 2 | 50.45 | .... | 2.00 | 100.50 | .... | 0.40 |
| 10 | 240 | 3 | 10.06 | 4.00 | .... | 95.50 | 0.80 | .... |
| 15 | 240 | 2 | 9.49 | 4.30 | .... | 97.40 | 0.70 | .... |
| 5 | 240 | 3 | 8.08 | .... | 18.05 | 102.60 | .... | 1.30 |
| 25 | 240 | 2 | 50.40 | .... | 4.30 | 101.70 | .... | 1.70 |
| 3–½ | 240 | 3 | 12.80 | 1.10 | .... | 97.80 | .... | 3.20 |
| 7–½ | 240 | 3 | 10.92 | .... | 1.26 | 91.40 | 2.40 | .... |
| 25 | 240 | 2 | 10.17 | 8.35 | .... | 102.07 | 1.50 | .... |
| 25 | 240 | 3 | 10.38 | .... | 6.60 | 100.40 | 0.10 | .... |
| 25 | 120 | 2 | 9.85 | 1.50 | .... | 99.77 | .... | 2.70 |
| 25 | 120 | 2 | 10.20 | .... | 1.10 | 101.70 | .... | 4.00 |
| 5 | 200 | 3 | 10.00 | 1.80 | .... | 100.00 | 4.00 | .... |
| 15 | 240 | 3 | 9.94 | 4.60 | .... | 99.50 | 5.40 | .... |
| 7–½ | 240 | 3 | 10.37 | .... | 5.60 | 76.00 | 7.10 | .... |
| 7–½ | 240 | 3 | 10.04 | 1.00 | .... | 100.50 | 2.00 | .... |
| .. | 200 | 3 | 10.00 | .... | 2.70 | 100.00 | O. K. | .... |
| 80–2$\phi$ | 200 | 3 | 10.00 | 1.70 | .... | 50.00 | 1.70 | .... |
| 150 | 240 | 3 | 9.85 | .... | 0.40 | 90.80 | .... | 1.50 |
| 300 | 240 | 2 | 9.75 | 1.55 | .... | 48.30 | 1.10 | .... |

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| Operating Company. | Test Number. |
|---|---|
| April, 1908— | |
| New York Edison Company | 263 |
| New York Edison Company | 264 |
| New York Edison Company | 265 |
| United Electric Light and Power Company | 266-A |
| United Electric Light and Power Company | 267-A |
| New York Edison Company | 268 |
| New York Edison Company | 269 |
| New York Edison Company | 270 |
| New York Edison Company | 271 |
| New York Edison Company | 272 |
| Engineering Supervision Company | 273 |
| New York Edison Company | 274 |
| New York Edison Company | 275 |
| New York Edison Company | 276 |
| Engineering Supervision Company | 277 |
| New York Edison Company | 278 |
| Brooklyn Edison Company | 279-A |
| Brooklyn Edison Company | 280-A |
| New York Edison Company | 281 |
| New York Edison Company | 282 |
| Brooklyn Edison Company | 283-A |
| New York Edison Company | 284 |
| New York Edison Company | 285 |
| New York Edison Company | 286-A |
| New York Edison Company | 287 |
| New York Edison Company | 288 |
| New York Edison Company | 289 |
| New York Edison Company | 290 |
| New York and Queens Electric Light and Power Company | 291-A |
| New York and Queens Electric Light and Power Company | 292-A |
| New York and Queens Electric Light and Power Company | 293-A |
| New York Edison Company | 294 |
| New York Edison Company | 295 |
| New York Edison Company | 296 |
| New York Edison Company | 297 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 150 | 240 | 3 | 9.65 | .... | 0.70 | 90.90 | 0.45 | .... |
| 15 | 240 | 3 | 10.40 | 9.45 | .... | 99.00 | 0.55 | .... |
| 15 | 240 | 3 | 9.95 | 4.60 | .... | 91.00 | .... | 2.20 |
| 20 | 200 | 3 | 10.00 | .... | 0.60 | 100.00 | 0.50 | .... |
| 5 | 200 | 3 | 10.00 | .... | 0.10 | 100.00 | 1.10 | .... |
| 10 | 240 | 3 | 10.30 | 11.30 | .... | 98.50 | 13.00 | .... |
| 25 | 240 | 2 | 51.70 | 0.70 | .... | 102.50 | .... | 1.20 |
| 3-½ | 240 | 3 | 13.05 | .... | 27.90 | 101.10 | .... | 2.80 |
| 50 | 240 | 2 | 51.20 | .... | 2.80 | 101.75 | .... | 2.30 |
| 25 | 240 | 2 | 50.45 | .... | 1.60 | 100.50 | .... | 1.10 |
| 15 | 220 | 3 | 10.80 | 25.00 | .... | 98.50 | 20.00 | .... |
| 7-½ | 240 | 3 | 11.60 | 11.80 | .... | 100.30 | 7.10 | .... |
| 50 | 240 | 2 | 10.60 | 22.10 | .... | 99.00 | 1.00 | .... |
| 5 | 240 | 3 | 8.80 | .... | 4.90 | 100.60 | .... | 1.00 |
| 5 | 220 | 2 | 10.10 | .... | 5.60 | 109.70 | .... | 2.00 |
| 15 | 240 | 3 | 9.93 | .... | 9.10 | 99.40 | .... | 3.30 |
| 10 | 230 | 3 | 17.99 | 1.20 | .... | 79.50 | .... | 2.50 |
| 25 | 115 | 2 | .... | .... | .... | 173.60 | .... | 2.30 |
| 25 | 240 | 3 | 10.05 | 1.40 | .... | 94.40 | 0.70 | .... |
| 15 | 240 | 3 | 9.69 | .... | 0.30 | 99.20 | .... | 1.90 |
| 150.2ϕ | 200 | 3 | .... | .... | .... | 21.00 | 1.15 | .... |
| 15 | 240 | 2 | 49.70 | 2.40 | .... | 96.50 | 4.30 | .... |
| 5 | 240 | 2 | .... | .... | .... | 110.00 | 5.20 | .... |
| 10 | 200 | 3 | 11.14 | 1.30 | .... | 104.50 | 2.40 | .... |
| 50 | 240 | 2 | 50.07 | .... | 3.30 | 101.10 | .... | 0.60 |
| 25 | 240 | 2 | 10.54 | .... | 5.30 | 100.20 | .... | 2.00 |
| 100 | 240 | 2 | 10.32 | .... | 8.10 | 100.40 | 0.70 | .... |
| 3-½ | 240 | 3 | 14.22 | .... | 16.50 | 92.20 | 1.50 | .... |
| 200 | 200 | 2 | 3.05 | 1.70 | .... | 28.15 | 2.30 | .... |
| 200 | 200 | 2 | 2.99 | 3.60 | .... | 29.34 | 2.40 | .... |
| 40 | 100 | 2 | 4.95 | 1.00 | .... | 52.50 | 0.60 | .... |
| 15 | 240 | 3 | 10.00 | .... | 100.00 | 100.00 | .... | 100.00 |
| 15 | 240 | 3 | 10.22 | 0.40 | .... | 97.40 | .... | 0.30 |
| 25 | 240 | 2 | 50.30 | .... | 0.30 | 102.90 | .... | 0.80 |
| 50 | 240 | 3 | 10.36 | 2.40 | .... | 99.20 | 1.20 | .... |

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| Operating Company. | Test Number. |
|---|---|
| April, 1908— | |
| New York Edison Company | 298 |
| New York Edison Company | 299 |
| May, 1908— | |
| New York Edison Company | 300 |
| Flatbush Gas and Electric Company | 301-A |
| New York Edison Company | 302 |
| New York Edison Company | 303 |
| New York Edison Company | 304 |
| New York Edison Company | 305 |
| New York Edison Company | 306 |
| New York Edison Company | 307 |
| Brooklyn Edison Company | 308 |
| New York Edison Company | 309 |
| New York Edison Company | 310 |
| New York Edison Company | 311 |
| United Electric Light and Power Company | 312-A |
| New York Edison Company | 313 |
| New York Edison Company | 314 |
| New York Edison Company | 315 |
| Brooklyn Edison Company | 316-A |
| June, 1908— | |
| New York Edison Company | 317 |
| New York Edison Company | 318 |
| McCready Estate | 319 |
| New York Edison Company | 320 |
| New York Edison Company | 321 |
| New York Edison Company | 322 |
| New York Edison Company | 323 |
| New York Edison Company | 324 |
| New York Edison Company | 325 |
| July, 1908— | |
| New York Edison Company | 326 |
| Brooklyn Edison Company | 327 |
| New York Edison Company | 328 |
| New York Edison Company | 329 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 10 | 240 | 2 | 53.10 | .... | 0.50 | 101.20 | .... | 0.10 |
| 15 | 240 | 2 | 10.50 | 1.00 | .... | 99.20 | .... | 1.10 |
| 7-½ | 240 | 3 | 10.20 | .... | 15.80 | 93.80 | 4.10 | .... |
| 15 | 220 | 3 | 13.80 | .... | 2.40 | 115.00 | .... | 1.20 |
| 50 | 240 | 3 | 9.53 | .... | 2.50 | 82.50 | .... | 0.60 |
| 10 | 240 | 2 | 9.58 | 4.30 | 4.30 | 94.70 | 3.95 | .... |
| 3-½ | 240 | 3 | 14.00 | .... | 0.80 | 95.40 | 0.60 | .... |
| 3-½ | 240 | 3 | 14.48 | .... | 2.10 | 100.00 | .... | 0.60 |
| 25 | 240 | 3 | 9.44 | .... | 4.80 | 100.00 | .... | 5.10 |
| 15 | 240 | 3 | 10.26 | .... | 4.40 | 97.40 | 1.50 | .... |
| 5 | 230 | 3 | 8.86 | .... | 0.30 | 98.30 | 0.60 | .... |
| 10 | 240 | 3 | 9.95 | .... | 2.10 | 98.50 | .... | 0.20 |
| 7-½ | 240 | 3 | 11.65 | 0.30 | .... | 103.70 | .... | 1.90 |
| 50 | 240 | 2 | 10.04 | .... | 7.70 | 100.40 | 1.20 | .... |
| 120 | 200 | 3 | 10.00 | 0.30 | .... | 100.00 | 0.60 | .... |
| 5 | 240 | 2 | 47.50 | .... | 4.60 | 96.30 | 0.20 | .... |
| 50 | 240 | 2 | 24.80 | .... | 16.60 | 99.50 | .... | 13.80 |
| 15 | 240 | 2 | 47.60 | 4.80 | .... | 93.90 | 4.00 | .... |
| 10 | 220 | 2 | 11.70 | .... | 0.30 | 47.00 | 0.10 | .... |
| 7-½ | 240 | 3 | 10.98 | .... | 1.60 | 92.90 | .... | 0.90 |
| 15 | 240 | 3 | 11.43 | 0.70 | .... | 100.20 | 1.40 | .... |
| 15 | 220 | 2 | 9.65 | 28.20 | .... | 40.40 | 19.00 | .... |
| 25 | 240 | 3 | 10.20 | 13.00 | .... | 97.10 | 7.80 | .... |
| 15 | 240 | 2 | 8.15 | .... | 5.90 | 95.90 | .... | 11.30 |
| 15 | 240 | 3 | 11.56 | 1.30 | .... | 93.90 | 0.20 | .... |
| 15 | 240 | 3 | 10.72 | 0.50 | .... | 93.40 | .... | 0.60 |
| 10 | 240 | 2 | 11.89 | .... | 0.20 | 67.80 | 7.20 | .... |
| 15 | 240 | 2 | 9.09 | .... | 0.40 | 95.00 | .... | 0.90 |
| 10 | 240 | 2 | 11.88 | .... | 2.10 | 98.50 | 0.90 | .... |
| 5 | 100 | 2 | 58.00 | 0.10 | .... | 116.20 | 0.40 | .... |
| 10 | 240 | 2 | 12.43 | 0.70 | .... | 98.30 | 3.00 | .... |
| 7-½ | 240 | 3 | 11.48 | .... | 22.90 | 102.40 | 1.70 | .... |

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| Operating Company. | Test Number. |
|---|---|
| July, 1908— | |
| New York Edison Company | 330 |
| New York Edison Company | 331 |
| Local Plant | 332 |
| New York Edison Company | 333 |
| New York Edison Company | 334 |
| August, 1908— | |
| New York Edison Company | 335 |
| New York Edison Company | 336 |
| New York Edison Company | 337 |
| New York Edison Company | 338 |
| New York Edison Company | 339 |
| New York Edison Company | 340 |
| New York Edison Company | 341 |
| New York Edison Company | 342 |
| September, 1908— | |
| Local Plant | 343 |
| New York and Queens Electric Light and Power Company | 344-A |
| New York and Queens Electric Light and Power Company | 345-A |
| New York Edison Company | 346 |
| New York Edison Company | 347 |
| October, 1908— | |
| New York Edison Company | 348 |
| New York Edison Company | 349 |
| New York Edison Company | 350 |
| New York Edison Company | 351 |
| United Electric Light and Power Company | 352-A |
| New York Edison Company | 353 |
| New York Edison Company | 354 |
| New York Edison Company | 355 |
| New York Edison Company | 356 |
| New York Edison Company | 357 |
| New York Edison Company | 358 |
| New York Edison Company | 359 |
| New York Edison Company | 360 |
| New York Edison Company | 361 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 25 | 240 | 2 | 10.01 | 2.90 | .... | 99.50 | 0.10 | .... |
| 10 | 240 | 2 | 50.40 | 1.40 | .... | 95.70 | 1.40 | .... |
| 300 | 115 | 2 | 3.11 | 38.00 | .... | 22.20 | 9.60 | .... |
| 75 | 240 | 3 | 9.72 | .... | 3.80 | 75.00 | .... | 1.30 |
| 7-½ | 240 | 3 | 10.68 | .... | 0.30 | 91.20 | 2.00 | .... |
| 10 | 240 | 3 | 10.00 | .... | 23.20 | 100.70 | .... | 1.40 |
| 15 | 240 | 3 | 8.53 | 1.10 | .... | 96.60 | 5.10 | .... |
| 25 | 240 | 3 | 9.39 | 1.00 | .... | 96.00 | 2.00 | .... |
| 50 | 240 | 3 | 9.62 | .... | 0.15 | 88.50 | .... | 1.50 |
| 50 | 240 | 2 | 9.74 | .... | 14.90 | 88.70 | .... | 1.00 |
| 25 | 240 | 3 | 7.64 | .... | 4.30 | 94.70 | 0.60 | .... |
| 15 | 240 | 3 | 9.45 | .... | 6.10 | 93.40 | .... | 1.00 |
| 15 | 240 | 3 | 10.01 | 1.10 | .... | 96.40 | 1.10 | .... |
| 25 | 220 | 2 | 9.78 | .... | 11.20 | 97.00 | .... | 8.80 |
| 400 | 200 | 2 | .... | .... | .... | 67.10 | 3.40 | .... |
| 400 | 200 | 2 | .... | .... | .... | 53.50 | 3.00 | .... |
| 50 | 240 | 3 | 9.75 | .... | 3.50 | 95.90 | 0.30 | .... |
| 15 | 240 | 3 | 9.42 | .... | 15.50 | 95.30 | .... | 12.50 |
| 7-½ | 240 | 3 | 10.06 | .... | 1.10 | 101.20 | 1.20 | .... |
| 15 | 240 | 3 | 10.12 | .... | 9.50 | 95.50 | .... | 3.80 |
| 25 | 240 | 2 | 9.97 | 0.40 | .... | 93.80 | 0.40 | .... |
| 7-½ | 240 | 3 | 9.66 | .... | 1.20 | 98.10 | .... | 2.40 |
| 20-2$\phi$ | 200 | 3 | 10.00 | .... | 0.12 | 100.00 | O. K. | .... |
| 75 | 240 | 3 | 10.13 | 6.60 | .... | 101.10 | .... | 0.50 |
| 3,000 | 120 | 2 | 10.02 | 3.50 | .... | 63.30 | .... | 1.10 |
| 1,200 | 120 | 2 | 10.01 | 2.50 | .... | 65.50 | 0.10 | .... |
| 1,200 | 120 | 2 | 10.22 | .... | 3.30 | 65.40 | .... | 3.00 |
| 600 | 240 | 2 | 10.96 | .... | 2.80 | 97.00 | .... | 0.50 |
| 3,000 | 120 | 2 | 9.25 | 0.50 | .... | 60.90 | .... | 0.70 |
| 150 | 240 | 3 | 9.90 | .... | 20.00 | 98.70 | .... | 15.60 |
| 50 | 240 | 2 | 10.37 | .... | 7.20 | 103.30 | .... | 1.00 |
| 7-½ | 240 | 3 | 11.60 | .... | 66.35 | 102.30 | .... | 7.60 |

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| Operating Company. | Test Number. |
|---|---|
| October, 1908— | |
| New York Edison Company | 362 |
| New York Edison Company | 363 |
| New York Edison Company | 364 |
| New York Edison Company | 365 |
| November, 1908— | |
| New York Edison Company | 366 |
| United Electric Light and Power Company | 367-A |
| New York Edison Company | 368-A |
| New York and Queens Electric Light and Power Company | 369-A |
| New York and Queens Electric Light and Power Company | 370-A |
| December, 1908— | |
| United Electric Light and Power Company | 371-A |
| United Electric Light and Power Company | 372-A |
| New York Edison Company | 373 |
| New York Edison Company | 374 |
| New York Edison Company | 375 |
| Richmond Light and Railway Company | 376-A |
| New York Edison Company | 377 |
| New York Edison Company | 378 |
| New York Edison Company | 379 |

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| Capacity of Meter. | | Wire. | Light Load. | | | Full Load. | | |
|---|---|---|---|---|---|---|---|---|
| Amperes. | Volts. | | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. | Per Cent. Load. | Per Cent. Fast. | Per Cent. Slow. |
| 10 | 240 | 3 | 8.84 | .... | 0.10 | 103.30 | .... | 0.20 |
| 50 | 240 | 3 | 10.18 | .... | 1.80 | 101.10 | .... | 1.70 |
| 10 | 240 | 3 | 8.75 | 0.80 | .... | 103,30 | 0.20 | 1.70 |
| 5 | 240 | 3 | 10.67 | 2.00 | .... | 99.10 | 0.80 | .... |
| 10 | 240 | 3 | 13.25 | .... | 2.30 | 96.20 | .... | 1.80 |
| 10 | 100 | 2 | 10.00 | .... | 4.30 | 100.00 | O. K. | .... |
| 15 | 220 | 3 | 10.00 | .... | 4.00 | 100.00 | .... | 1.40 |
| 80 | 100 | 2 | 10.00 | 1.40 | .... | 57.00 | 2.90 | .... |
| 80 | 100 | 2 | 10.00 | 0.50 | .... | 63.00 | 2.60 | .... |
| 10 | 100 | 2 | 10.00 | .... | 7.87 | 100.00 | .... | 0.90 |
| 10 | 100 | 2 | 10.00 | .... | 8.85 | 100.00 | .... | 3.97 |
| 7.5 | 240 | 3 | 10.00 | 0.66 | .... | 100.00 | .... | 2.80 |
| 10 | 240 | 2 | 10.00 | 7.70 | .... | 100.00 | 1.40 | .... |
| 7.5 | 240 | 3 | 10.00 | 2.00 | .... | 100.00 | .... | 2.64 |
| 25 | 110 | 2 | 11.40 | 2.20 | .... | 103.00 | 3.00 | .... |
| 75 | 240 | 3 | 10.04 | 1.30 | .... | 98.70 | 0.46 | .... |
| 75 | 240 | 2 | 10.14 | 2.40 | .... | 100.80 | 1.33 | .... |
| 10 | 240 | 3 | 10.23 | 0.60 | .... | 101.00 | 1.40 | .... |

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## REPORT OF DIVISION OF GAS EXAMINATIONS.

Office of Chief Gas Examiner,
No. 122 Bowery,
New York, May 15, 1909.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I submit herewith a report of the tests made at the photometric stations for 1908.

A station was opened at No. 1784 Shore road, Sheepshead Bay, on October 12, for the testing of the gas supplied by the Brooklyn Borough Gas Company. This is the last station which I think will be required for testing the gas supplies of Greater New York.

Very truly yours,

E. G. LOVE, Chief Gas Examiner.

Candle Power Tests—Averages for Quarter Ending March 31, 1908.

| Gas Company. | January. | February. | March. | Averages. | Violations. |
|---|---|---|---|---|---|
| Consolidated Branch, No. 1..... | 23.00 | 22.76 | 22.71 | 22.82 | 1 |
| Consolidated Branch, No. 2..... | 23.19 | 22.58 | 22.83 | 22.87 | 1 |
| Consolidated Branch, No. 3..... | *.... | *.... | 23.03 | 23.03 | 1 |
| Consolidated Branch, No. 4..... | *.... | *.... | 23.04 | 23.04 | .. |
| Consolidated Branch, No. 6..... | *.... | *.... | 23.01 | 23.01 | 2 |
| New York Mutual..... | 23.72 | 22.89 | 24.07 | 23.56 | 3 |
| New Amsterdam ..... | *.... | *.... | 23.23 | 23.23 | .. |
| Standard ..... | *.... | *.... | 22.53 | 22.53 | 2 |
| Brooklyn Union, Williamsburg..... | 23.08 | 23.01 | 23.02 | 23.04 | 1 |
| Brooklyn Union, Nassau..... | 22.82 | 22.92 | 22.85 | 22.86 | 1 |
| Brooklyn Union, Fulton..... | 22.72 | 23.71 | 23.62 | 23.35 | 7 |
| Brooklyn Union, Citizens'..... | 23.36 | 23.39 | 24.27 | 23.84 | 2 |
| Brooklyn Union, Metropolitan..... | 24.14 | 23.56 | 23.64 | 23.78 | 2 |
| New York and Richmond..... | 22.95 | 22.67 | 22.89 | 22.84 | 5 |
| Kings County Lighting..... | 22.92 | 23.34 | 23.31 | 23.19 | 3 |
| Queens Borough Gas and Electric.... | 22.89 | 23.08 | 23.53 | 23.17 | 2 |
| New York and Queens..... | 24.11 | 23.95 | 23.74 | 23.93 | 2 |
| Central Union ..... | 22.67 | 22.60 | 22.51 | 22.59 | 9 |
| Bronx Gas and Electric..... | 23.97 | 23.98 | 23.82 | 23.92 | .. |
| Brooklyn Borough ..... | ..... | ..... | ..... | ..... | .. |

*Moving station.

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Candle Power Tests—Averages for Quarter Ending June 30, 1908.

| Gas Company. | April. | May. | June. | Averages. | Violations. |
|---|---|---|---|---|---|
| Consolidated Branch, No. 1..... | 22.98 | 22.37 | 23.10 | 22.82 | 2 |
| Consolidated Branch, No. 2..... | 23.08 | 22.63 | 23.11 | 22.94. | .. |
| Consolidated Branch, No. 3..... | 22.91 | 23.02 | 22.72 | 22.88 | .. |
| Consolidated Branch, No. 4..... | 22.95 | 22.97 | 22.54 | 22.82 | 2 |
| Consolidated Branch, No. 6..... | 22.52 | 22.52 | 22.49 | 22.51 | 8 |
| New York Mutual..... | 23.97 | 23.73 | 24.11 | 23.94 | .. |
| New Amsterdam ..... | 23.06 | 22.63 | 22.73 | 22.81 | 2 |
| Standard ..... | 22.34 | 22.43 | 22.69 | 22.49 | 2 |
| Brooklyn Union, Williamsburg..... | 23.58 | 23.09 | 23.36 | 23.34 | .. |
| Brooklyn Union, Nassau..... | 23.18 | 22.94 | 23.29 | 23.14 | .. |
| Brooklyn Union, Fulton..... | 23.26 | 23.61 | 23.53 | 23.47 | 2 |
| Brooklyn Union, Citizens'..... | 23.90 | 23.76 | 23.96 | 23.87 | 1 |
| Brooklyn Union, Metropolitan..... | 24.00 | 23.86 | 22.40 | 23.42 | 6 |
| New York and Richmond..... | 23.23 | 23.03 | 23.35 | 23.20 | 3 |
| Kings County Lighting..... | 23.13 | 23.02 | 22.86 | 23.00 | 1 |
| Queens Borough Gas and Electric.... | 23.07 | 23.50 | 23.65 | 23.41 | .. |
| New York and Queens..... | 23.72 | 23.57 | 24.44 | 23.91 | 1 |
| Central Union ..... | 22.44 | 22.42 | 22.87 | 22.58 | 5 |
| Bronx Gas and Electric..... | 23.96 | 25.42 | 25.24 | 24.87 | 2 |
| Brooklyn Borough ..... | ..... | ..... | ..... | ..... | .. |

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Candle Power Tests—Averages for Quarter Ending September 30, 1908.

| Gas Company. | July. | August. | September. | Averages. | Violations. |
|---|---|---|---|---|---|
| Consolidated Branch, No. 1..... | 23.30 | 22.98 | 22.56 | 22.95 | .. |
| Consolidated Branch, No. 2..... | 23.33 | 22.94 | 22.62 | 22.96 | .. |
| Consolidated Branch, No. 3..... | 23.05 | 22.66 | 22.77 | 22.83 | .. |
| Consolidated Branch, No. 4..... | 22.75 | 22.46 | 22.71 | 22.64 | 1 |
| Consolidated Branch, No. 6..... | 22.76 | 22.76 | 22.71 | 22.74 | 1 |
| New York Mutual..... | 23.87 | 23.94 | 23.23 | 23.68 | .. |
| New Amsterdam ..... | 22.98 | 23.06 | 23.04 | 23.03 | .. |
| Standard ..... | 22.89 | 22.83 | 22.74 | 22.82 | .. |
| Brooklyn Union, Williamsburg..... | 22.85 | 22.64 | 23.46 | 22.98 | 4 |
| Brooklyn Union, Nassau..... | 22.40 | 22.38 | 23.33 | 22.70 | 8 |
| Brooklyn Union, Fulton..... | 22.95 | 23.96 | 25.46 | 24.12 | 4 |
| Brooklyn Union, Citizens'..... | 22.98 | 23.18 | 23.19 | 23.12 | 3 |
| Brooklyn Union, Metropolitan..... | 23.13 | 22.69 | 22.87 | 22.90 | 4 |
| New York and Richmond..... | 23.19 | 22.78 | 23.09 | 23.02 | 3 |
| Kings County Lighting..... | 23.17 | 22.62 | 22.48 | 22.76 | 2 |
| Queens Borough Gas and Electric.... | 23.22 | 23.76 | 23.27 | 23.42 | 1 |
| New York and Queens..... | 23.94 | 23.95 | 24.00 | 23.96 | .. |
| Central Union ..... | 22.66 | 22.89 | 22.70 | 22.75 | 5 |
| Bronx Gas and Electric..... | 24.68 | 25.16 | 23.97 | 24.60 | .. |
| Brooklyn Borough ..... | ..... | ..... | ..... | ..... | .. |

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## Candle Power Tests—Averages for Quarter Ending December 31, 1908.

| Gas Company. | October. | November. | December. | Averages. | Violations. |
|---|---|---|---|---|---|
| Consolidated Branch, No. 1..... | 22.87 | 23.13 | 23.18 | 23.06 | .. |
| Consolidated Branch, No. 2..... | 22.83 | 23.15 | 23.20 | 23.06 | .. |
| Consolidated Branch, No. 3..... | 22.66 | 23.28 | 22.82 | 22.92 | 2 |
| Consolidated Branch, No. 4..... | 22.79 | 23.42 | 22.88 | 23.03 | 1 |
| Consolidated Branch, No. 6..... | 22.84 | 23.34 | 23.04 | 23.07 | 1 |
| New York Mutual..... | 23.40 | 23.77 | 23.91 | 23.69 | .. |
| New Amsterdam ..... | 22.96 | 23.49 | 23.09 | 23.18 | .. |
| Standard ..... | 22.71 | 22.89 | 22.75 | 22.78 | 2 |
| Brooklyn Union, Williamsburg..... | 22.27 | 22.89 | 22.20 | 22.45 | 14 |
| Brooklyn Union, Nassau..... | 22.12 | 22.80 | 22.23 | 22.38 | 14 |
| Brooklyn Union, Fulton..... | 24.26 | 24.66 | 23.86 | 24.26 | 1 |
| Brooklyn Union, Citizens'..... | 23.56 | 23.94 | 23.99 | 23.83 | 2 |
| Brooklyn Union, Metropolitan..... | 23.34 | 22.77 | 24.48 | 23.53 | 1 |
| New York and Richmond..... | 22.82 | 22.84 | 23.07 | 22.91 | 5 |
| Kings County Lighting..... | 22.81 | 23.58 | 23.45 | 23.28 | 1 |
| Queens Borough Gas and Electric.... | 23.11 | 22.97 | 22.61 | 22.90 | 4 |
| New York and Queens..... | 23.69 | 23.38 | 23.38 | 23.48 | .. |
| Central Union ..... | 22.60 | 22.71 | 22.76 | 22.69 | 4 |
| Bronx Gas and Electric..... | 22.82 | 22.51 | 22.61 | 22.65 | 4 |
| Brooklyn Borough ..... | 23.06 | 21.22 | 21.01 | 21.76 | 26 |

## Candle Power Tests—Averages for Year 1908.

| Gas Company. | Averages. | Violations. | Gas Company. | Averages. | Violations. |
|---|---|---|---|---|---|
| Consolidated Branch, No. 1. | 22.91 | 3 | Brooklyn Union, Citizens'.. | 23.66 | 8 |
| Consolidated Branch, No. 2. | 22.96 | 1 | Brooklyn Union, Metropoli- | | |
| Consolidated Branch, No. 3. | 22.91 | 3 | tan ..... | 23.41 | 13 |
| Consolidated Branch, No. 4. | 22.88 | 4 | New York and Richmond.. | 22.99 | 16 |
| Consolidated Branch, No. 6. | 22.83 | 12 | Kings County Lighting.... | 23.06 | 7 |
| New York Mutual..... | 23.72 | 3 | Queens Borough Gas and | | |
| New Amsterdam ..... | 23.06 | 2 | Electric ..... | 23.22 | 7 |
| Standard ..... | 22.65 | 6 | New York and Queens.... | 23.82 | 3 |
| Brooklyn Union, Williams- | | | Central Union ..... | 22.65 | 23 |
| burg ..... | 22.95 | 19 | Bronx Gas and Electric... | 24.01 | 6 |
| Brooklyn Union, Nassau.. | 22.77 | 23 | Brooklyn Borough ..... | 21.76 | 26 |
| Brooklyn Union, Fulton... | 23.80 | 14 | | | |

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Specific Gravity Tests—Averages for Quarter Ending March 31, 1908.

| Gas Company. | January. | February. | March. | Averages. |
|---|---|---|---|---|
| Consolidated Branch No. 1 | .684 | .678 | .675 | .679 |
| Consolidated Branch No. 2 | .684 | .673 | .669 | .675 |
| Consolidated Branch No. 3 | *.... | *.... | .604 | .604 |
| Consolidated Branch No. 4 | *.... | *.... | .598 | .598 |
| Consolidated Branch No. 6 | *.... | *.... | .637 | .637 |
| New York Mutual | .655 | .683 | .661 | .666 |
| New Amsterdam | *.... | *.... | .605 | .605 |
| Standard | *.... | *.... | .599 | .599 |
| Brooklyn Union, Williamsburgh | .653 | .661 | .663 | .659 |
| Brooklyn Union, Nassau | .664 | .655 | .665 | .661 |
| Brooklyn Union, Fulton | .663 | .676 | .666 | .668 |
| Brooklyn Union, Citizens' | .670 | .676 | .673 | .673 |
| Brooklyn Union, Metropolitan | .673 | .668 | .656 | .666 |
| New York and Richmond | .634 | .639 | .638 | .637 |
| Kings County Lighting | .639 | .639 | .614 | .631 |
| Queens Borough Gas and Electric | .669 | .670 | .673 | .671 |
| New York and Queens | .631 | .634 | .633 | .633 |
| Central Union | .622 | .627 | .621 | .623 |
| Bronx Gas and Electric | .651 | .659 | .659 | .656 |
| Brooklyn Borough | .... | .... | .... | .... |

* Moving station.

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Specific Gravity Tests—Averages for Quarter Ending June 30, 1908.

| Gas Company. | April. | May. | June. | Averages. |
|---|---|---|---|---|
| Consolidated Branch No. 1 | .682 | .688 | .693 | .688 |
| Consolidated Branch No. 2 | .686 | .690 | .688 | .688 |
| Consolidated Branch No. 3 | .605 | .631 | .641 | .626 |
| Consolidated Branch No. 4 | .603 | .641 | .628 | .624 |
| Consolidated Branch No. 6 | .637 | .660 | .677 | .658 |
| New York Mutual | .690 | .691 | .690 | .690 |
| New Amsterdam | .594 | .586 | .565 | .582 |
| Standard | .593 | .592 | .592 | .592 |
| Brooklyn Union, Williamsburgh | .660 | .648 | .653 | .654 |
| Brooklyn Union, Nassau | .655 | .648 | .654 | .652 |
| Brooklyn Union, Fulton | .668 | .671 | .673 | .671 |
| Brooklyn Union, Citizens' | .676 | .671 | .672 | .673 |
| Brooklyn Union, Metropolitan | .697 | .750 | .743 | .730 |
| New York and Richmond | .638 | .646 | .651 | .645 |
| Kings County Lighting | .648 | .642 | .634 | .641 |
| Queens Borough Gas and Electric | .668 | .666 | .657 | .664 |
| New York and Queens | .612 | .632 | .627 | .624 |
| Central Union | .607 | .603 | .627 | .612 |
| Bronx Gas and Electric | .642 | .650 | .657 | .650 |
| Brooklyn Borough | .... | .... | .... | .... |

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Specific Gravity Tests—Averages for Quarter Ending September 30, 1908

| Gas Company. | July. | August. | September. | Averages. |
|---|---|---|---|---|
| Consolidated Branch No. 1 | .661 | .684 | .684 | .676 |
| Consolidated Branch No. 2 | .657 | .682 | .678 | .672 |
| Consolidated Branch No. 3 | .614 | .624 | .634 | .624 |
| Consolidated Branch No. 4 | .642 | .648 | .651 | .647 |
| Consolidated Branch No. 6 | .672 | .613 | .628 | .638 |
| New York Mutual | .664 | .661 | .680 | .668 |
| New Amsterdam | .558 | .577 | .583 | .573 |
| Standard | .579 | .589 | .581 | .583 |
| Brooklyn Union, Williamsburgh | .650 | .665 | .665 | .660 |
| Brooklyn Union, Nassau | .648 | .665 | .665 | .659 |
| Brooklyn Union, Fulton | .681 | .666 | .682 | .676 |
| Brooklyn Union, Citizens' | .676 | .670 | .673 | .673 |
| Brooklyn Union, Metropolitan | .717 | .774 | .699 | .730 |
| New York and Richmond | .649 | .648 | .649 | .649 |
| Kings County Lighting | .628 | .649 | .634 | .637 |
| Queens Borough Gas and Electric | .656 | .664 | .657 | .659 |
| New York and Queens | .644 | .639 | .641 | .641 |
| Central Union | .612 | .618 | .630 | .620 |
| Bronx Gas and Electric | .670 | .699 | .669 | .679 |
| Brooklyn Borough | .... | .... | .... | .... |

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## Specific Gravity Tests—Averages for Quarter Ending December 31, 1908.

| Gas Company. | October. | November. | December. | Averages. |
|---|---|---|---|---|
| Consolidated Branch No. 1 | .666 | .684 | .685 | .678 |
| Consolidated Branch No. 2 | .666 | .684 | .687 | .679 |
| Consolidated Branch No. 3 | .624 | .604 | .594 | 607 |
| Consolidated Branch No. 4 | .654 | .592 | .589 | .612 |
| Consolidated Branch No. 6 | .628 | .613 | .608 | .616 |
| New York Mutual | .674 | .676 | .693 | .681 |
| New Amsterdam | .583 | .582 | .577 | .581 |
| Standard | .586 | .584 | .581 | .584 |
| Brooklyn Union, Williamsburgh | .658 | .660 | .640 | .653 |
| Brooklyn Union, Nassau | .658 | .660 | .650 | .656 |
| Brooklyn Union, Fulton | .667 | .707 | .674 | .683 |
| Brooklyn Union, Citizens' | .672 | .669 | .666 | .669 |
| Brooklyn Union, Metropolitan | .772 | .698 | .670 | .713 |
| New York and Richmond | .649 | .655 | .652 | .652 |
| Kings County Lighting | .657 | .658 | .640 | .652 |
| Queens Borough Gas and Electric | .653 | .655 | .624 | .644 |
| New York and Queens | .639 | .637 | .608 | .628 |
| Central Union | .612 | .616 | .606 | .611 |
| Bronx Gas and Electric | .663 | .664 | .659 | .662 |
| Brooklyn Borough | .628 | .597 | .607 | .611 |

## Specific Gravity Tests—Averages for Year 1908.

| Gas Company. | Averages. | Gas Company. | Averages. |
|---|---|---|---|
| Consolidated Branch, No. 1 | .680 | Brooklyn Union, Fulton | .674 |
| Consolidated Branch, No. 2 | .678 | Brooklyn Union, Citizens' | .672 |
| Consolidated Branch, No. 3 | .615 | Brooklyn Union, Metropolitan | .710 |
| Consolidated Branch, No. 4 | .620 | New York and Richmond | .646 |
| Consolidated Branch, No. 6 | .637 | Kings County Lighting | .640 |
| New York Mutual | .676 | Queens Borough Gas and Electric | .659 |
| New Amsterdam | .585 | New York and Queens | .631 |
| Standard | .589 | Central Union | .616 |
| Brooklyn Union, Williamsburg | .656 | Bronx Gas and Electric | .662 |
| Brooklyn Union, Nassau | .657 | Brooklyn Borough | .611 |

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Sulphur and Ammonia Tests—Averages

| Gas Company. | April. Grains in 100 Cu. Ft. Sulphur. | Ammonia. | Sulphuretted Hydrogen. |
|---|---|---|---|
| Consolidated Branch No. 1 | 4.93 | .... | *.... |
| Consolidated Branch No. 2 | 5.40 | .... | .... |
| Consolidated Branch No. 3 | 5.49 | .... | .... |
| Consolidated Branch No. 4 | 14.01 | .... | .... |
| Consolidated Branch No. 6 | 11.95 | .... | .... |
| New York Mutual | 6.02 | .... | †.... |
| New Amsterdam | 10.84 | .... | .... |
| Standard | 16.11 | .... | .... |
| Brooklyn Union, Williamsburgh | 2.56 | .... | .... |
| Brooklyn Union, Nassau | 3.48 | .40 | †.... |
| Brooklyn Union, Fulton | 4.15 | .... | .... |
| Brooklyn Union, Citizens' | 5.84 | .... | .... |
| Brooklyn Union, Metropolitan | 5.78 | .09 | †.... |
| New York and Richmond | 5.32 | .... | †.... |
| Kings County Lighting | 7.56 | .21 | .... |
| Queens Borough Gas and Electric | .... | .... | *.... |
| New York and Queens | .... | .... | .... |
| Central Union | .... | .... | †.... |
| Bronx Gas and Electric | .... | .... | .... |
| Brooklyn Borough | .... | .... | .... |

* Trace occasionally. † Trace.

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for Quarter Ending March 31, 1908.

| February. | | | March. | | | Averages. | |
|---|---|---|---|---|---|---|---|
| Grains in 100 Cu. Ft. | | Sulphuretted Hydrogen. | Grains in 100 Cu. Ft. | | Sulphuretted Hydrogen. | Grains in 100 Cu. Ft. | |
| Sulphur. | Ammonia. | | Sulphur. | Ammonia. | | Sulphur. | Ammonia. |
| 5.69 | .... | †.... | 6.27 | .... | †.... | 5.78 | .03 |
| 5.82 | .... | .... | 5.75 | .... | .... | 5.67 | .... |
| 5.59 | .... | .... | 5.77 | .... | .... | 5.63 | .03 |
| ‡.... | ‡.... | ‡.... | 13.33 | .14 | .... | 13.33 | .05 |
| ‡.... | ‡.... | ‡.... | 10.75 | .... | .... | 10.75 | .... |
| 6.71 | .... | .... | 7.51 | .... | *.... | 6.83 | .... |
| 9.62 | .... | .... | 15.00 | .... | .... | 11.13 | .... |
| ‡.... | ‡.... | ‡.... | 14.86 | .... | .... | 14.86 | .... |
| 4.13 | .... | †.... | 3.41 | .... | †.... | 3.80 | .03 |
| 4.11 | .12 | †.... | 3.24 | .... | †.... | 4.16 | .04 |
| 6.92 | .63 | .... | 5.98 | .... | .... | 6.54 | .21 |
| 4.59 | .... | .... | 6.01 | .26 | .... | 5.56 | .13 |
| 5.94 | .73 | *.... | 4.38 | .26 | †.... | 5.10 | .46 |
| 5.26 | .24 | †.... | 5.32 | .50 | †.... | 5.49 | .25 |
| 6.65 | .22 | .... | 6.41 | .13 | *.... | 6.79 | .13 |
| .... | .... | .... | .... | .... | †.... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | †.... | .... | .... | †.... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... |

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Sulphur and Ammonia Tests—Averages

| Gas Company. | July. Grains in 100 Cu. Ft. Sulphur. | Ammonia. | Sulphuretted Hydrogen. |
|---|---|---|---|
| Consolidated Branch No. 1 | 9.44 | .... | .... |
| Consolidated Branch No. 2 | 8.62 | .... | .... |
| Consolidated Branch No. 3 | 8.09 | .... | .... |
| Consolidated Branch No. 4 | 15.80 | .... | .... |
| Consolidated Branch No. 6 | 10.18 | .... | .... |
| New York Mutual | 8.31 | .... | *.... |
| New Amsterdam | 21.83 | .... | .... |
| Standard | 21.24 | .... | .... |
| Brooklyn Union, Williamsburgh | 2.38 | .... | *.... |
| Brooklyn Union, Nassau | 3.47 | .41 | *.... |
| Brooklyn Union, Fulton | 6.35 | .12 | .... |
| Brooklyn Union, Citizens' | 5.88 | .... | .... |
| Brooklyn Union, Metropolitan | 7.38 | .51 | †.... |
| New York and Richmond | 6.09 | .... | *.... |
| Kings County Lighting | 5.69 | .33 | .... |
| Queens Borough Gas and Electric | .... | .... | *.... |
| New York and Queens | .... | .... | †.... |
| Central Union | .... | .... | .... |
| Bronx Gas and Electric | .... | .... | .... |
| Brooklyn Borough | .... | .... | .... |

* Trace. † Trace occasionally.

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for Quarter Ending September 30, 1908.

| August. | | | September. | | | Averages. | |
|---|---|---|---|---|---|---|---|
| Grains in 100 Cu. Ft. | | Sulphuretted Hydrogen. | Grains in 100 Cu. Ft. | | Sulphuretted Hydrogen. | Grains in 100 Cu. Ft. | |
| Sulphur. | Ammonia. | | Sulphur. | Ammonia. | | Sulphur. | Ammonia. |
| 9.24 | .... | .... | 6.61 | .... | .... | 8.43 | .... |
| 8.35 | .... | .... | 5.94 | .... | .... | 7.64 | .... |
| 8.71 | .... | .... | 7.27 | .... | .... | 8.02 | .... |
| 12.74 | .33 | .... | 13.11 | .... | .... | 13.88 | .11 |
| 13.06 | .... | .... | 13.76 | .... | .... | 12.33 | .... |
| 9.39 | .... | *.... | 7.90 | .... | *.... | 8.53 | .... |
| 18.46 | .... | .... | 15.15 | .... | .... | 18.48 | .... |
| 13.04 | .... | .... | 20.15 | .... | .... | 18.14 | .... |
| 3.64 | .... | *.... | 3.14 | .14 | *.... | 3.05 | .05 |
| 2.38 | .58 | *.... | 1.73 | .18 | *.... | 2.53 | .39 |
| 4.75 | .... | .... | 2.92 | .07 | *.... | 4.67 | .06 |
| 4.54 | .... | .... | 2.42 | .... | .... | 4.01 | .... |
| 5.80 | .21 | †.... | 5.75 | .12 | *.... | 6.31 | .28 |
| 5.65 | .43 | *.... | 5.50 | .17 | *.... | 5.75 | .20 |
| 7.82 | .17 | .... | 6.68 | .21 | .... | 6.73 | .24 |
| .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | †.... | .... | .... | .... | .... | .... |
| .... | .... | *.... | .... | .... | *.... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... |

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## Sulphur and Ammonia Tests—Averages

| Gas Company. | October. Grains in 100 Cu. Ft. Sulphur. | Ammonia. | Sulphuretted Hydrogen. |
|---|---|---|---|
| Consolidated Branch No. 1 | 6.17 | .02 | .... |
| Consolidated Branch No. 2 | 6.55 | .... | .... |
| Consolidated Branch No. 3 | 6.15 | .... | .... |
| Consolidated Branch No. 4 | 11.80 | .24 | .... |
| Consolidated Branch No. 6 | 12.45 | .... | .... |
| New York Mutual | 6.68 | .... | *.... |
| New Amsterdam | 16.90 | .... | .... |
| Standard | 13.98 | .... | .... |
| Brooklyn Union, Williamsburgh | 2.44 | .39 | *.... |
| Brooklyn Union, Nassau | 1.86 | .60 | *.... |
| Brooklyn Union, Fulton | 1.99 | .... | *.... |
| Brooklyn Union, Citizens' | 3.65 | .07 | .... |
| Brooklyn Union, Metropolitan | 5.27 | .27 | †.... |
| New York and Richmond | 6.04 | .20 | *.... |
| Kings County Lighting | 6.95 | .04 | .... |
| Queens Borough Gas and Electric | .... | .... | *.... |
| New York and Queens | .... | .... | †.... |
| Central Union | .... | .... | .... |
| Bronx Gas and Electric | .... | .... | .... |
| Brooklyn Borough | .... | .... | *.... |

* Trace. † Trace occasionally.

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for Quarter Ending December 31, 1908.

| November. | | | December. | | | Averages. | |
|---|---|---|---|---|---|---|---|
| Grains in 100 Cu. Ft. | | Sulphuretted Hydrogen. | Grains in 100 Cu. Ft. | | Sulphuretted Hydrogen. | Grains in 100 Cu. Ft. | |
| Sulphur. | Ammonia. | | Sulphur. | Ammonia. | | Sulphur. | Ammonia. |
| 7.04 | .16 | .... | 7.08 | .... | .... | 6.76 | .06 |
| 6.62 | .... | .... | 6.30 | .... | .... | 6.49 | .... |
| 6.57 | .... | .... | 3.47 | .... | .... | 5.40 | .... |
| 12.72 | .20 | .... | 18.59 | .... | .... | 14.37 | .15 |
| 13.40 | .... | .... | 15.82 | .... | .... | 13.89 | .... |
| 7.13 | .... | *.... | 5.97 | .... | *.... | 6.59 | .... |
| 14.69 | .... | .... | 10.33 | .... | .... | 13.97 | .... |
| 15.53 | .... | .... | 18.59 | .... | .... | 16.03 | .... |
| 1.99 | .39 | *.... | 8.09 | .65 | *.... | 4.17 | .48 |
| 2.16 | .62 | *.... | 4.70 | .67 | *.... | 2.91 | .63 |
| 3.11 | .... | .... | 3.64 | .06 | .... | 2.91 | .02 |
| 2.47 | .... | .... | 4.18 | .04 | .... | 3.43 | .04 |
| 5.93 | .41 | †.... | 5.78 | .23 | †.... | 5.66 | .30 |
| 8.67 | .... | *.... | 6.90 | .04 | *.... | 7.20 | .08 |
| 6.92 | .65 | .... | 6.35 | 3.11 | .... | 6.74 | 1.27 |
| .... | .... | *.... | .... | .... | *.... | .... | .... |
| .... | .... | *.... | .... | .... | *.... | .... | .... |
| .... | .... | *.... | .... | .... | *.... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | *.... | .... | .... | *.... | .... | .... |

## Sulphur and Ammonia Tests—Averages for Year 1908.

| Gas Company. | Averages. Grains in 100 Cu. Ft. Sulphur. | Ammonia. | Gas Company. | Averages. Grains in 100 Cu. Ft. Sulphur. | Ammonia. |
|---|---|---|---|---|---|
| Consolidated Branch, No. 1. | 6.83 | .02 | Brooklyn Union, Citizens'.. | 4.76 | .04 |
| Consolidated Branch, No. 2. | 6.55 | ... | Brooklyn Union, Metropolitan ..... | 5.69 | .31 |
| Consolidated Branch, No. 3. | 6.40 | .01 | New York and Richmond. | 6.02 | .13 |
| Consolidated Branch, No. 4. | 14.13 | .08 | Kings County Lighting.... | 6.91 | .47 |
| Consolidated Branch, No. 6. | 12.04 | ... | Queens Borough Gas and Electric ..... | .... | ... |
| New York Mutual..... | 7.21 | ... | New York and Queens..... | .... | ... |
| New Amsterdam ..... | 15.31 | ... | Central Union ..... | .... | ... |
| Standard ..... | 17.32 | ... | Bronx Gas and Electric.... | .... | ... |
| Brooklyn Union, Williamsburg ..... | 3.55 | .14 | Brooklyn Borough ..... | .... | ... |
| Brooklyn Union, Nassau... | 3.18 | .33 | | | |
| Brooklyn Union, Fulton... | 5.13 | .08 | | | |

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Pressure Tests—Averages for

| Gas Company. | Place at Which Pressure Was Taken. |
|---|---|
| Consolidated Branch, No. 1..... | Grand street, corner Bowery, Manhattan..... |
| Consolidated Branch, No. 2..... | Grand street, corner Bowery, Manhattan..... |
| Consolidated Branch, No. 3..... | Grand street, corner Bowery, Manhattan..... |
| Consolidated Branch, No. 3..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Consolidated Branch, No. 4..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Consolidated Branch, No. 6..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| New York Mutual..... | Grand street, corner Bowery, Manhattan..... |
| New Amsterdam ..... | Grand street, corner Bowery, Manhattan..... |
| New Amsterdam ..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Standard ..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Brooklyn Union, Williamsburg..... | Rodney street, corner Lee avenue, Brooklyn..... |
| Brooklyn Union, Nassau..... | Rodney street, corner Lee avenue, Brooklyn..... |
| Brooklyn Union, Fulton..... | Court street, corner Atlantic avenue, Brooklyn..... |
| Brooklyn Union, Citizens'..... | Court street, corner Atlantic avenue, Brooklyn..... |
| Brooklyn Union, Metropolitan..... | Sixth avenue, near Union street, Brooklyn..... |
| New York and Richmond..... | No. 407 Richmond terrace, New Brighton, S. I..... |
| Kings County Lighting..... | No. 5912 New Utrecht avenue, Brooklyn..... |
| Queens Borough Gas and Electric... | No. 6 North Fairview avenue, Hammels..... |
| New York and Queens..... | Corner Madison and Boerum avenues, Flushing..... |
| Central Union ..... | One Hundred and Forty-eighth street and Third avenue, The Bronx ..... |
| Bronx Gas and Electric..... | No. 49 Morris Park avenue, The Bronx..... |
| Brooklyn Borough..... | No. 1784 Shore road, Sheepshead Bay..... |

* Moving station.

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Quarter Ending March 31, 1908.

| January. | | February. | | March. | | Averages. | |
|---|---|---|---|---|---|---|---|
| Maximum. | Minimum. | Maximum. | Minimum. | Maximum. | Minimum. | Maximum. | Minimum. |
| Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 2.75 | 2.04 | 2.74 | 2.17 | 2.56 | 2.08 | 2.68 | 2.10 |
| 2.31 | 1.77 | 2.34 | 1.95 | 2.27 | 1.82 | 2.31 | 1.85 |
| 2.52 | 2.19 | 2.57 | 2.30 | 2.32 | 2.10 | 2.47 | 2.20 |
| .... | .... | .... | .... | .... | .... | .... | .... |
| *... | *... | *... | *... | 2.66 | 2.30 | 2.66 | 2.30 |
| *... | *... | *... | *... | 2.33 | 1.91 | 2.33 | 1.91 |
| 2.60 | 2.21 | 2.57 | 2.26 | 2.55 | 2.22 | 2.57 | 2.23 |
| 2.47 | 1.83 | 2.46 | 2.01 | 2.50 | 2.08 | 2.48 | 1.97 |
| *... | *... | *... | *... | 2.54 | 2.14 | 2.54 | 2.14 |
| *... | *... | *... | *... | 2.66 | 2.01 | 2.66 | 2.01 |
| 3.25 | 2.00 | 3.40 | 1.90 | 3.45 | 1.95 | 3.37 | 1.95 |
| 3.30 | 1.95 | 3.60 | 1.90 | 3.70 | 1.95 | 3.53 | 1.93 |
| 2.72 | 2.01 | 3.04 | 2.15 | 2.83 | 2.15 | 2.86 | 2.10 |
| 3.65 | 1.77 | 3.53 | 1.79 | 3.32 | 1.80 | 3.50 | 1.79 |
| 2.89 | 1.66 | 3.14 | 1.74 | 3.19 | 1.78 | 3.07 | 1.73 |
| 3.35 | 1.46 | 3.59 | 1.59 | 3.99 | 1.83 | 3.64 | 1.63 |
| 5.85 | 1.58 | 5.72 | 1.69 | 5.68 | 1.51 | 5.75 | 1.59 |
| 3.49 | 2.46 | 3.49 | 2.35 | 3.50 | 2.39 | 3.49 | 2.40 |
| 3.72 | 2.22 | 3.83 | 2.20 | 3.60 | 2.02 | 3.72 | 2.15 |
| 2.21 | 1.82 | 2.10 | 1.87 | 2.16 | 1.87 | 2.16 | 1.85 |
| 2.48 | 1.45 | 2.30 | 1.32 | 2.22 | 1.35 | 2.33 | 1.37 |
| .... | .... | .... | .... | .... | .... | .... | .... |

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Pressure Tests—Averages for

| Gas Company. | Place at Which Pressure Was Taken. |
|---|---|
| Consolidated Branch, No. 1..... | Grand street, corner Bowery, Manhattan..... |
| Consolidated Branch, No. 2..... | Grand street, corner Bowery, Manhattan..... |
| Consolidated Branch, No. 3..... | Grand street, corner Bowery, Manhattan..... |
| Consolidated Branch, No. 3..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Consolidated Branch, No. 4..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Consolidated Branch, No. 6..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| New York Mutual..... | Grand street, corner Bowery, Manhattan..... |
| New Amsterdam ..... | Grand street, corner Bowery, Manhattan..... |
| New Amsterdam ..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Standard ..... | Seventy-ninth street, corner Third avenue, Manhattan..... |
| Brooklyn Union, Williamsburg..... | Rodney street, corner Lee avenue, Brooklyn..... |
| Brooklyn Union, Nassau..... | Rodney street, corner Lee avenue, Brooklyn..... |
| Brooklyn Union, Fulton..... | Court street, corner Atlantic avenue, Brooklyn..... |
| Brooklyn Union, Citizens'..... | Court street, corner Atlantic avenue, Brooklyn..... |
| Brooklyn Union, Metropolitan..... | Sixth avenue, near Union street, Brooklyn..... |
| New York and Richmond..... | No. 407 Richmond terrace, New Brighton, S. I..... |
| Kings County Lighting..... | No. 5912 New Utrecht avenue, Brooklyn..... |
| Queens Borough Gas and Electric... | No. 6 North Fairview avenue, Hammels..... |
| New York and Queens..... | Corner Madison and Boerum avenues, Flushing..... |
| Central Union ..... | One Hundred and Forty-eighth street and Third avenue, The Bronx ..... |
| Bronx Gas and Electric..... | No. 49 Morris Park avenue, The Bronx..... |
| Brooklyn Borough..... | No. 1284 Shore road, Sheepshead Bay..... |

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Quarter Ending September 30, 1908.

| July. | | August. | | September. | | Averages. | |
|---|---|---|---|---|---|---|---|
| Maximum. | Minimum. | Maximum. | Minimum. | Maximum. | Minimum. | Maximum. | Minimum. |
| Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 2.22 | 2.07 | 2.23 | 2.03 | 2.21 | 1.84 | 2.22 | 1.98 |
| 2.31 | 1.98 | 2.19 | 1.96 | 2.13 | 1.81 | 2.21 | 1.92 |
| 2.36 | 2.14 | 2.16 | 1.97 | 1.99 | 1.76 | 2.17 | 1.96 |
| .... | .... | .... | .... | .... | .... | .... | .... |
| 2.63 | 2.31 | 2.65 | 2.34 | 2.67 | 2.31 | 2.65 | 2.32 |
| 2.47 | 1.86 | 2.42 | 1.94 | 2.37 | 1.97 | 2.42 | 1.92 |
| 2.34 | 2.15 | 2.30 | 2.17 | 2.29 | 2.12 | 2.31 | 2.15 |
| 2.72 | 2.31 | 2.62 | 2.29 | 2.51 | 1.94 | 2.62 | 2.18 |
| 2.70 | 2.31 | 2.66 | 2.28 | 2.64 | 2.25 | 2.67 | 2.28 |
| 2.63 | 2.10 | 2.61 | 2.09 | 2.51 | 1.91 | 2.58 | 2.00 |
| 3.90 | 2.00 | 3.35 | 2.00 | 3.20 | 2.00 | 3.48 | 2.00 |
| 3.95 | 2.00 | 3.40 | 2.00 | 3.20 | 2.00 | 3.52 | 2.00 |
| 2.90 | 2.07 | 2.78 | 2.10 | 2.79 | 2.15 | 2.82 | 2.11 |
| 3.33 | 1.69 | 3.19 | 1.67 | 2.82 | 1.88 | 3.11 | 1.75 |
| 4.09 | 1.75 | 3.99 | 1.72 | 3.50 | 1.69 | 3.86 | 1.72 |
| 4.15 | 2.11 | 4.00 | 2.13 | 3.76 | 1.79 | 3.97 | 2.01 |
| 4.14 | 1.53 | 4.11 | 1.57 | 6.08 | 1.63 | 4.78 | 1.58 |
| 4.31 | 1.83 | 4.32 | 1.30 | 4.34 | 2.13 | 4.32 | 1.75 |
| 3.69 | 2.34 | 4.03 | 2.52 | 4.09 | 2.37 | 3.94 | 2.41 |
| 2.16 | 1.88 | 2.17 | 1.97 | 2.12 | 1.88 | 2.15 | 1.91 |
| 2.31 | 1.82 | 2.22 | 1.74 | 2.45 | 1.31 | 2.33 | 1.62 |
| .... | .... | .... | .... | .... | .... | .... | .... |

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## Pressure Tests—Averages for Year 1908.

| Gas Company and Place at Which Pressure Was Taken. | Averages. Maximum. Inches. | Averages. Minimum. Inches. |
|---|---|---|
| Consolidated Branch, No. 1, Grand street, corner Bowery, Manhattan..... | 2.41 | 1.93 |
| Consolidated Branch, No. 2, Grand street, corner Bowery, Manhattan..... | 2.26 | 1.81 |
| Consolidated Branch, No. 3, Grand street, corner Bowery, Manhattan..... | 2.20 | 1.97 |
| Consolidated Branch, No. 3, Seventy-ninth street, corner Third avenue, Manhattan ..... | .... | .... |
| Consolidated Branch, No. 4, Seventy-ninth street, corner Third avenue, Manhattan ..... | 2.66 | 2.32 |
| Consolidated Branch, No. 6, Seventy-ninth street, corner Third avenue, Manhattan ..... | 2.40 | 1.93 |
| New York Mutual, Grand street, corner Bowery, Manhattan..... | 2.45 | 2.17 |
| New Amsterdam, Grand street, corner Bowery, Manhattan..... | 2.59 | 2.05 |
| New Amsterdam, Seventy-ninth street, corner Third avenue, Manhattan.... | 2.63 | 2.23 |
| Standard, Seventy-ninth street, corner Third avenue, Manhattan..... | 2.62 | 2.01 |
| Brooklyn Union, Williamsburg, Rodney street, corner Lee avenue, Brooklyn | 3.64 | 2.01 |
| Brooklyn Union, Nassau, Rodney street, corner Lee avenue, Brooklyn..... | 3.79 | 2.06 |
| Brooklyn Union, Fulton, Court street, corner Atlantic avenue, Brooklyn.... | 2.84 | 2.11 |
| Brooklyn Union, Citizens', Court street, corner Atlantic avenue, Brooklyn.. | 3.56 | 1.82 |
| Brooklyn Union, Metropolitan, Sixth avenue, near Union street, Brooklyn. | 3.49 | 1.72 |
| New York and Richmond, No. 407 Richmond terrace, New Brighton, S. I.. | 3.98 | 1.76 |
| Kings County Lighting, No. 5912 New Utrecht avenue, Brooklyn..... | 5.52 | 1.59 |
| Queens Borough Gas and Electric, No. 6 North Fairview avenue, Hammels. | 3.82 | 2.28 |
| New York and Queens, corner Madison and Boerum avenues, Flushing.... | 3.91 | 2.28 |
| Central Union, One Hundred and Forty-eighth street and Third avenue, The Bronx ..... | 2.18 | 1.90 |
| Bronx Gas and Electric, No. 49 Morris Park avenue, The Bronx..... | 2.40 | 1.47 |
| Brooklyn Borough, No. 1784 Shore road, Sheepshead Bay..... | 5.18 | 2.52 |

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## REPORT OF DIVISION OF AUDITING AND ACCOUNTS.

City of New York, May 26, 1909.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—In compliance with your request in the matter of settlements made by the City with the various lighting companies, on account of liabilities outstanding for services rendered from January, 1903, and prior to July 31, 1908, based upon adjustments approved by the Comptroller and the Commissioner of Water Supply, Gas and Electricity, acting under the advice and approval of the Corporation Counsel of the Law Department, I beg to submit the following report of your Division of Auditing and Accounts·

During the latter part of the year 1907, the work of adjustment and compromise in settling the various outstanding accounts of the lighting companies against the City became so voluminous and involved, in the many different financial, engineering and legal features, that this Department realized that concerted action on the part of the City officials should be taken in the matter of these settlements, as well as the new contracts to be entered into, recurring annually, and it seemed most expedient that a modus operandi should be devised to handle these matters and clarify the situation as rapidly as possible, thereby saving interest charges that were accruing.

Owing to the many legal complications that had arisen, this Department was unable to facilitate the certification for payment of the bills of the several companies. At the urgent request of the Chief Engineer of Light and Power of the Department of Water Supply, Gas and Electricity, and pursuant to the opinion of the Corporation Counsel, it was decided that representatives from the Departments of Finance, Law and Water Supply, Gas and Electricity, should constitute a Board to pass finally on all lighting matters, and it was agreed between these several Departments that Mr. Charles S. Hervey, Chief Examiner and Statistician of the Bureau of Investigation for the Department of Finance; Hon. William P. Burr, Assistant Corporation Counsel, for the Department of Law, and Mr. C. F. Lacombe, Chief Engineer of Light and Power for the Department of Water Supply, Gas and Electricity, should constitute this Board, and on October 28, 1907, the aforesaid gentlemen held an organization meeting and elected the following officers: Mr. Charles S. Hervey, Chairman, and Mr. H. R. Emerson, Secretary. This Board was entitled "The Committee on Lighting," and since its organization has taken up all matters pertaining to settlements, compromises, stipulations and contracts to be entered into, and at its several meetings during 1908, this Division, by its work in the examination, audit, compilation and tabulation of the several accounts, assisted the Committee in the consummation of the settlements and propositions submitted at various times. Much of the work done has been only of a tentative nature, or leading up to final settlement. Some of the

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work, e. g., Newton Gas Company and Richmond Light and Railroad Company, had entailed much research and labor.

Owing to a ruling of the Comptroller, this Department is now meeting the demands of the various companies by certifying against its funds bills for service rendered to various Departments which had originally been provided with moneys to pay for such service, but have no longer balances. This entails extra work on this Department in order to safeguard the City and close the accounts.

During the year 1908, the following accounts were acted upon by your Bureau, viz.:

BOROUGHS OF MANHATTAN AND THE BRONX.

New York Mutual Gas Light Company.

Acting upon advice from the Corporation Counsel, this Department certified, in accordance with the terms of proposition made by the New York Mutual Gas Light Company, 60 per cent. of the outstanding bills for gas consumed by the City from January 1, 1903, to and including May 31, 1908, and the Comptroller approved the payment on the above basis of the following amounts:

The Comptroller approved the payment of 60 per cent. on bills rendered at 90 cents for the period January 1, 1903, to and including June 30, 1905, and at 75 cents from July 1, 1905, to May 31, 1908. This resulted in the payment of the following amounts:

| Bills Rendered. | | Payments. | |
|---|---|---|---|
| 1903 | $4,649 49 | 1903 | $774 46 |
| | | Bills for Board of Education, paid out of funds of that Department.. | 2,015 23 |
| 1904 | 6,015 96 | 1904 | 2,780 51 |
| | | From funds of this Department, entitled Revenue Bond Fund for Lighting Public Buildings during year 1904 | 829 06 |
| 1905, to June 30 | 3,288 42 | | |
| 1905, to December 31 | 2,030 83 | 1905 | 3,191 55 |
| 1906 | 6,502 12 | 1906 | 3,901 27 |
| 1907 | 8,047 57 | 1907 | 4,828 54 |
| 1908, to May 31 | 4,543 12 | 1908 | 2,725 87 |
| Total | $35,077 51 | Total | $21,046 49 |

The above represent payments for lighting public buildings only for the periods noted above, and it is to be noted that in the period subsequent to July 1, 1905, the above represent part payments to the amount of 45 cents per 1,000 cubic feet on account.

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BOROUGH OF BROOKLYN.

Edison Electric Illuminating Company of Brooklyn.

In continuation of settlement proposed by the City on the lines maintained by this Department and accepted by the company during the year 1907 further payments on account were made to this company, as follows:

1903 Account.

| | |
|---|---|
| February 20, 1908, third payment on account of principal | $30,000 00 |
| February 26, 1908, final payment in full of principal | 11,910 05 |

1904 Account.

| | |
|---|---|
| February 20, 1908, third payment on account of principal | 100,000 00 |
| February 20, 1908, third payment on account of principal (schools) | 4,000 00 |
| April 3, 1908, final payment on account of principal | 32,013 43 |
| April 3, 1908, final payment on account of principal (schools) | 1,141 46 |

1905 Account.

| | |
|---|---|
| February 20, 1908, third payment on account of principal | 45,000 00 |
| September 22, 1908, final payment in full of principal | 14,901 25 |

Month of January, 1906 Account.

| | |
|---|---|
| February 20, 1908 (lighting), second payment on account of principal | 20,000 00 |
| September 23, 1908 (lighting), final payment in full of principal | 4,142 86 |
| February 20, 1908 (power), first payment on account of principal | 1,000 00 |
| September 23, 1908 (power), final payment in full of principal | 681 87 |
| Total certified by Department | $264,790 92 |
| Total interest charges, to be paid by Department of Finance | 230,000 00 |
| Recommended on account of outside Departments | 10,000 00 |
| Total | $504,790 92 |

In addition to the certification for payment by this Department of the above amounts, this Bureau advised the Department of Finance that there was in excess of $230,000 due for interest charges accruing to the company on the basis of the opinion of the Corporation Counsel, which stated that the company was to be allowed 6 per cent. interest on all claims and that interest charges were to be computed on the following basis:

"For the periods of service January 1, 1903, to March 15, 1904, and March 16, 1905, to January 31, 1906, interest is allowed from thirty days after filing claim with the Comptroller. For the period March 16, 1904, to March 16, 1905, interest is allowed from forty-five days after the rendering of service."

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On this basis of computation your Bureau submitted figures and tables showing the interest charges accrued on the above basis and the Comptroller approved and certified for payment out of the funds of the Department of Finance for the above amount. Furthermore, owing to the balances due the company from Departments not within the jurisdiction of this Department, statements were prepared by your Bureau showing, as far as possible, such balances due, and upon said facts the Department of Finance approved and certified for payment $10,000 on account of these various Departments noted above.

I beg to report, in connection with the balance still due the above company, that your Bureau is now engaged in the examination and audit of all balances due this company by all the Departments in the City, and probably will be able to make final report during the latter part of 1909. It is needless to add that the matter of verification of payments by the accounts of the various outside Departments is tedious and involves much research, owing to the fact that this Department has had no control over the funds of these Departments; but your Auditor is hopeful that this account will be closed up during the year 1909.

Brooklyn Union Gas Company.

In continuation of the settlement made by and between the City and this company this Department certified for payment during 1908 as follows:

| | |
|---|---|
| March 19, 1908 (1905 Account)—In full payment of principal..... | $196,944 81 |
| July 1, 1908 (1906 Account)—In full payment of principal..... | 142.358 25 |
| November 14, 1908 (1907 Account)—In full payment of principal..... | 128,320 44 |

In addition to the above this Department prepared tables and statements showing that there was due on account of 1904 principal, interest charges amounting to $32,300.56. Same was computed on the period thirty days after filing of claim with the Department of Finance to the date of final payment, and this payment represents the final amount due on account of interest charges on the basis of settlements with this company, interest charges for service subsequent to the year 1904 having been waived by the company.

Flatbush Gas Company.

A settlement was made by and between the City and this company on the basis of the following resolution, passed by the Committee on Lighting at its meeting held July 30, 1908, in which it was

"Resolved, That it is recommended that the Commissioner of Water Supply, Gas and Electricity certify for payment the balance due the Flatbush Gas Company for service in lighting electric arc lamps on Ocean parkway, in the Borough of Brooklyn, such certification for payment to be based on the rate of $97.50 per lamp per year, which

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rate has been accepted by the company in its letter to the Chief Engineer of Light and Power, Department of Water Supply, Gas and Electricity, dated July 27, 1908."

On the above basis this Department certified for payment at $97.50 per lamp per year all balances due for services rendered for the period January 1, 1903, to and including January 31, 1906, after which date a contract was entered into and executed by and between the City and the company for this service. Prior to July 1, 1905, the company had rendered bills at the rate of 32 cents, or $116.80 per annum.

| Bills Rendered. | | Payments, as Per Adjustment. | |
|---|---|---|---|
| 1903 | $7,578 24 | First payment on account | $4,165 60 |
| | | Final payment in full | 2,160 31 |
| 1904 | 7,707 52 | First payment on account | 780 80 |
| | | Final payment in full | 5,635 34 |
| 1905 | 7,040 20 | Final payment in full | 6,435 00 |
| 1906 (January) | 536 25 | Final payment in full | 536 25 |
| Total | $22,862 23 | Total | $19,713 30 |

No interest charges were claimed or allowed in this settlement.

In connection with the claims of this company, your Bureau has been unable to reach the accounts for service rendered in lighting public buildings by electricity, or for gas during the above periods, but we hope to be able during the present year to close those accounts.

## BOROUGH OF QUEENS.

### New York and Queens Gas Company.

Request was made by this company that they be allowed payments on account of bills rendered for lighting streets and public buildings during the years 1903, 1904, 1905 and January, 1906—the balance amounting to approximately $9,000—and in compliance with such request the Committee on Lighting passed the following resolution October 5, 1908:

"Resolved, That the New York and Queens Gas Company of the Borough of Queens be tendered $700 for the year 1903, $2,200 for the year 1904, $2,100 from January 1 to and including June 30, 1905, the same to apply to the amount due the said company pending a final examination and audit of the bills rendered by said company, and it is hereby recommended that the Department of Water Supply, Gas and Electricity certify for payment to the Department of Finance the several amounts as noted above."

In compliance with the above resolution this Department certified for payment the above noted amounts to the said company.

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BOROUGH OF RICHMOND.

New York and Richmond Gas Company.

At its meeting held May 5, 1908, the Committee on Lighting passed the following resolution:

"Resolved, That the Committee approve payments on account to the New York and Richmond Gas Company for the years 1902, 1903, 1904, 1905, 1906 and 1907, said payments to be based for the period prior to June 30, 1905, on a certification by the Department of Water Supply, Gas and Electricity, that there are on file in the said Department bills of the above mentioned company for lighting furnished in the aforesaid period to represent actual service to the City, in excess of $ , pending an examination of the above said bills in detail and their certification for presentation for audit to the Department of Finance; and for the period subsequent to June 30, 1905, payments to be made on the basis of a stipulation in which the said company agrees to accept the statutory rate of seventy-five cents per thousand feet consumption, with the reservation that said payment is to be made without prejudice to the rights of either the company or the City."

Upon the basis of the above resolution, this Department certified for payment to the Department of Finance the following:

| | |
|---|---|
| May 14, 1908, 1905 account | $813 41 |
| June 10, 1908, 1905 account | 798 77 |
| June 10, 1908, 1906 account | 1,760 73 |
| June 10, 1908, 1907 account | 2,236 86 |
| Total | $5,609 77 |

These amounts represented payments on account of bills rendered for service by this company on the basis of all the bills that were immediately in the possession of this Bureau, but, I have good reason to believe, did not include numerous accounts still unpaid. But under the provisions of the above resolution, and owing to the urgency of the request of the company, the above amounts were certified with a view to further examination when final settlement had been reached.

Richmond Light and Railroad Company.

On June 18, 1908, the Chief Engineer of Light and Power of this Department submitted a report in the matter of the service of this company in the Borough of Richmond, in which it was shown that the service rendered was of such a nature, in its inefficiency and in the dilatory manner in which the company was executing its existing contracts, that he recommended to the Committee that no further payments be made until the latter had remedied the many defects in the service, and in connection with this matter a conference was called that the Committee might

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discuss the various claims of the company with its officials, and in view of the fact that there seemed to be a very considerable amount of money due the company from the City, and upon the representation of the company that it needed funds to assist in the building up and bettering the service, the following resolution was passed by the Committee, at its meeting held on this date:

"Resolved, That in consideration of the receipt of a written agreement to be signed by a competent official of the Richmond Light and Railroad Company, wherein the company shall agree to carry out the improvements in its lighting system in the Borough of Richmond outlined in the letter of the Chief Engineer of Light and Power, Mr. Lacombe, to the Lighting Committee, dated June 18, 1908, said improvements to be commenced at once and completed to the satisfaction of the Chief Engineer of Light and Power prior to October 30, 1908, the Committee hereby recommends that the Commissioner of Water Supply, Gas and Electricity, certify for payment the sum of $100,000 on account of services rendered from January 1, 1903, to December 31, 1907; $50,000 of said payment to be paid before July 1, 1908, the remaining $50,000 to be certified for payment within two weeks thereafter, and the Committee further recommends that no further payments be made to the said company unless approved by a resolution of the Committee, the same being based on a certificate from the Chief Engineer of Light and Power in which he certifies that the work has progressed to his satisfaction and he is justified in certifying additional payments to the said Committee."

Pursuant to the above resolution, this Department certified for payment to the Department of Finance the following:

| | |
|---|---|
| June 25, 1908— | |
| Payment on account of 1903 | $12,500 00 |
| Revenue Bond Fund, payment on account of 1904 | 1,500 00 |
| June 25, 1908— | |
| Payment on account of 1904 | 11,000 00 |
| Payment on account of 1905 | 12,500 00 |
| Payment on account of 1907 | 12,500 00 |
| July 16, 1908— | |
| Payment on account of 1903 | 8,000 00 |
| Payment on account of 1904 | 11,000 00 |
| Payment on account of 1905 | 4,000 00 |
| Payment on account of 1907 | 27,000 00 |
| Total | $100,000 00 |

In connection with the accounts of this company, I beg to say that considerable work in auditing and examining claims and bills rendered has been done during

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the year, yet your Bureau has not been able, owing to the absence of a specific agreement for settlement, to set up the accounts finally, and all work that has been done had been of a tentative nature.

In conclusion, I wish to reiterate my request made in the 1907 annual report that the force of this Bureau be increased, the work of the Bureau being of such a nature that your Auditor, with the assistance of two Clerks and one Stenographer, has been at all times at a loss to comply with the requests from the Department of Finance and this Department for the details of claims, as I would wish and I hope that I may be able to obtain during the next year such assistants as may be necessary to facilitate the demands of the various Departments for information.

Aside from the details in compiling the tables leading up to settlements, compromises, etc., which amounted to over $1,000,000 during the year 1908, your Bureau has passed over $4,000,000 in contract and miscellaneous payments, and in addition to the same, owing to your assuming the direction of the various Bureaus of Electrical Inspection throughout the City, the work of passing the payments for account of these various Bureaus has also been added to the work of this Bureau, and my previous request as to increase of force I consider very reasonable.

Respectfully submitted,

H. R. EMERSON, Auditor of Bureau.

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## BUREAU OF LAMPS AND LIGHTING.

BOROUGHS OF MANHATTAN AND THE BRONX.

Total Expenditures and Outstanding Liabilities for Lighting Public Streets and Buildings, Heat and Power, Repairs, Salaries and Bureau Expenses, in the Boroughs of Manhattan and The Bronx, for the Year 1908.

Recapitulation of Expenditures, 1908.

| Appropriations. | Manhattan and The Bronx. | Brooklyn. | Queens. | Richmond. | Total. |
|---|---|---|---|---|---|
| Street and Park Lighting.... | $1,246,821 65 | $1,013,284 84 | $352,618 06 | $171,039 47 | $2,783,764 02 |
| Lighting Public Buildings.... | 498,109 80 | 161,550 96 | 28,958 21 | 20,518 28 | 709,137 25 |
| Heat and Power..... | 46,573 37 | 17,677 32 | 2,082 83 | 867 15 | 67,200 67 |
| Bureau Expenses..... | 18,718 82 | 4,089 01 | 4,959 32 | 1,974 98 | 29,742 13 |
| Salaries ..... | 88,262 28 | 26,629 16 | 11,245 20 | 7,999 98 | 134,136 62 |
| High Pressure Fire Service. | 62,887 54 | 41,084 55 | ..... | ..... | 103,972 09 |
| Testing Electric Meters..... | 1,500 00 | ..... | ..... | ..... | 1,500 00 |
| Total appropriations... | $1,962,873 46 | $1,264,315 84 | $399,863 62 | $202,399 86 | $3,829,452 78 |
| Revenue Bond Fund..... | 2,587 24 | ..... | ..... | ..... | 2,587 24 |
| Total..... | $1,965,460 70 | $1,264,315 84 | $399,863 62 | $202,399 86 | $3,832,040 02 |

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Statement Showing Classification of All Expenditures of the

| Appropriation. | Electricity. | | Gas. | |
|---|---|---|---|---|
| Street Lighting— | | | | |
| Manhattan and The Bronx..... | $666,199 95 | | $497,220 25 | |
| Brooklyn ..... | 530,756 18 | | 463,807 65 | |
| Queens ..... | 225,530 43 | | 112,098 26 | |
| Richmond ..... | 166,388 57 | | 4,650 90 | |
| | | $1,588,875 13 | | $1,077,777 06 |
| Public Buildings— | | | | |
| Manhattan and The Bronx..... | $290,330 31 | | $190,366 15 | |
| Brooklyn ..... | 96,567 90 | | 63,147 38 | |
| Queens ..... | 16,397 23 | | 12,199 40 | |
| Richmond ..... | 18,235 99 | | 2,225 41 | |
| | | 421,531 43 | | 267,938 34 |
| Heat and Power— | | | | |
| Manhattan and The Bronx..... | $29,912 74 | | ..... | |
| Brooklyn ..... | 14,586 86 | | $3,040 02 | |
| Queens ..... | 1,665 60 | | 417 23 | |
| Richmond ..... | 592 21 | | 268 62 | |
| | | 46,757 41 | | 3,725 87 |
| | | $2,057,163 97 | | $1,349,441 27 |
| Bureau Expenses— | | | | |
| Manhattan and The Bronx..... | $18,718 82 | | ..... | |
| Brooklyn ..... | 4,089 01 | | ..... | |
| Queens ..... | 4,959 32 | | ..... | |
| Richmond ..... | 1,974 98 | | ..... | |
| | | 29,742 13 | | ..... |
| Salaries— | | | | |
| Manhattan and The Bronx..... | $88,262 28 | | ..... | |
| Brooklyn ..... | 26,629 16 | | ..... | |
| Queens ..... | 11,245 20 | | ..... | |
| Richmond ..... | 7,999 98 | | ..... | |
| | | 134,136 62 | | ..... |
| High Pressure Fire Service— | | | | |
| Manhattan and The Bronx..... | $62,887 54 | | ..... | |
| Brooklyn ..... | 41,084 55 | | ..... | |
| | | 103,972 09 | | ..... |

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Bureau of Lamps and Lighting During the Year 1908.

| Naphtha. | | Steam. | | Total. | |
|---|---|---|---|---|---|
| $83,401 45 | | ..... | | $1,246,821 65 | |
| 18,721 01 | | ..... | | 1,013,284 84 | |
| 14,989 37 | | ..... | | 352,618 06 | |
| ..... | | ..... | | 171,039 47 | |
| ..... | $117,111 83 | ..... | ..... | ..... | $2,783,764 02 |
| ..... | | ..... | | $480,696 46 | |
| ..... | | ..... | | 159,715 28 | |
| ..... | | ..... | | 28,596 63 | |
| ..... | | ..... | | 20,461 40 | |
| ..... | ..... | ..... | ..... | ..... | 689,469 77 |
| ..... | | $16,660 63 | | $46,573 37 | |
| ..... | | ..... | | 17,626 88 | |
| ..... | | ..... | | 2,082 83 | |
| ..... | | ..... | | 860 83 | |
| ..... | ..... | ..... | 16,660 63 | ..... | 67,143 91 |
| | $117,111 83 | | $16,660 63 | | $3,540,377 70 |
| ..... | | ..... | | $18,718 82 | |
| ..... | | ..... | | 4,089 01 | |
| ..... | | ..... | | 4,959 32 | |
| ..... | | ..... | | 1,974 98 | |
| ..... | ..... | ..... | ..... | ..... | 29,742 13 |
| ..... | | ..... | | $88,262 28 | |
| ..... | | ..... | | 26,629 16 | |
| ..... | | ..... | | 11,245 20 | |
| ..... | | ..... | | 7,999 98 | |
| ..... | ..... | ..... | ..... | ..... | 134,136 62 |
| ..... | | ..... | | $62,887 54 | |
| ..... | | ..... | | 41,084 55 | |
| ..... | ..... | ..... | ..... | ..... | 103,972 09 |

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| Appropriation. | Electricity. | | Gas. | |
|---|---|---|---|---|
| Public Buildings— | Salaries. | | Inspections. | |
| Manhattan and The Bronx..... | $8,551 45 | | $944 90 | |
| Brooklyn ..... | ..... | | ..... | |
| Queens ..... | ..... | | ..... | |
| Richmond ..... | ..... | | ..... | |
| | | 8,551 45 | | 944 90 |
| Heat and Power— | Brooklyn Heights R. R. Co. | | Rentals. | |
| Brooklyn ..... | $50 44 | | ..... | |
| Richmond ..... | ..... | | $6 32 | |
| | | 50 44 | | 6 32 |
| Testing Electric Meters— | | | | |
| Manhattan and The Bronx..... | | 1,500 00 | | ..... |
| Revenue Bond Fund— | | $2,335,116 70 | | $1,350,392 49 |
| Manhattan and The Bronx..... | | 2,587 24 | | ..... |
| Total..... | | $2,337,703 94 | | $1,350,392 49 |

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| Naphtha. | | Steam. | | Total. | |
|---|---|---|---|---|---|
| Rentals. | | Transit Dev. Co. | | | |
| $7,916 99 | | ..... | | $17,413 34 | |
| 1,792 80 | | $42 88 | | 1,835 68 | |
| 361 58 | | ..... | | 361 58 | |
| 56 88 | | ..... | | 56 88 | |
| ——— | 10,128 25 | ——— | 42 88 | ——— | 19,667 48 |
| ..... | | ..... | | $50 44 | |
| ..... | | ..... | | 6 32 | |
| ——— | ..... | ——— | ..... | ——— | 56 76 |
| | ..... | | ..... | | 1,500 00 |
| | $127,240 08 | | $16,703 51 | | $3,829,452 78 |
| | ..... | | ..... | | 2,587 24 |
| | $127,240 08 | | $16,703 51 | | $3,832,040 02 |

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BUREAU OF LAMPS

Statement Showing Balances of All Appropria

| Appropriation Accounts. | |
|---|---|
| **Boroughs of Manhattan and The Bronx.** | |
| Heat, Light and Power, Bureau of Lamps and Lighting, Administration— | |
| Office of Chief Engineer: | |
| Salaries and Wages | |
| Office of Chief Gas Examiner | |
| Laboratory for Testing Electric Meters | |
| Total | |
| Heat, Light and Power, Bureau of Lamps and Lighting— | |
| Salaries and Wages | |
| Street and Park Lighting | |
| Lighting Public Buildings | |
| Bureau Expenses | |
| Heat and Power for City Departments, etc | |
| High Pressure Fire Service, Reservation of Machinery and Current | |
| Total | |
| Total, Manhattan and The Bronx | |
| **Borough of Brooklyn.** | |
| Heat, Light and Power, Bureau of Lamps and Lighting— | |
| Salaries and Wages | |
| Street and Park Lighting | |
| Lighting Public Buildings | |
| Bureau Expenses | |
| Heat and Power for City Departments, etc | |
| High Pressure Fire Service, Reservation of Machinery and Current | |
| Total | |
| **Borough of Queens.** | |
| Heat, Light and Power, Bureau of Lamps and Lighting— | |
| Salaries and Wages | |
| Street and Park Lighting | |
| Lighting Public Buildings | |

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AND LIGHTING.

tions for All Boroughs During the Year 1908.

| Funds Available. | | Expenditures. | | Balances. | |
|---|---|---|---|---|---|
| $17,650 00 | | $16,716 62 | | $933 38 | |
| 17,400 00 | | 16,345 15 | | 1,054 85 | |
| 1,500 00 | | 1,500 00 | | ..... | |
| | $36,550 00 | | $34,561 77 | | $1,988 23 |
| $55,890 00 | | $55,200 51 | | $689 49 | |
| 1,250,782 75 | | 1,246,821 65 | | 3,961 10 | |
| 498,200 00 | | 498,114 60 | | 85 40 | |
| 19,150 00 | | 18,718 82 | | 431 18 | |
| 46,940 00 | | 46,568 57 | | 371 43 | |
| 63,000 00 | | 62,887 54 | | 112 46 | |
| | 1,933,962 75 | | 1,928,311 69 | | 5,651 06 |
| | $1,970,512 75 | | $1,962,873 46 | | $7,639 29 |
| $26,860 00 | | $26,629 16 | | $230 84 | |
| 1,031,946 14 | | 1,013,284 84 | | 18,661 30 | |
| 176,045 00 | | 161,550 96 | | 14,494 04 | |
| 6,100 00 | | 4,089 01 | | 2,010 99 | |
| 17,840 00 | | 17,677 32 | | 162 68 | |
| 43,920 00 | | 41,084 55 | | 2,835 45 | |
| | $1,302,711 14 | | $1,264,315 84 | | $38,395 30 |
| $11,950 00 | | $11,245 20 | | $704 80 | |
| 368,439 95 | | 352,618 06 | | 15,821 89 | |
| 31,800 00 | | 28,958 21 | | 2,841 79 | |

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Appropriation Accounts.

Heat, Light and Power, Bureau of Lamps and Lighting—
Bureau Expenses.....
Heat and Power for City Departments, etc.....

Total.....

Borough of Richmond.

Heat, Light and Power, Bureau of Lamps and Lighting—
Salaries and Wages.....
Street and Park Lighting.....
Lighting Public Buildings.....
Bureau Expenses.....
Heat and Power for City Departments, etc.....

Total.....

Resume.

Salaries and Wages (All Boroughs).....
Street and Park Lighting (All Boroughs).....
Lighting Public Buildings (All Boroughs).....
Bureau Expenses (All Boroughs).....
Heat and Power for City Departments, etc. (All Boroughs).....
High Pressure Fire Service, Reservation of Machinery and Current (All Boroughs).....

Total.....
Administration .....

Grand total.....

* Deficit.

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| Funds Available. | | Expenditures. | | Balances. | |
|---|---|---|---|---|---|
| 5,850 00 | | 4,959 32 | | 890 68 | |
| 2,200 00 | | 2,082 83 | | 117 17 | |
| | $420,239 95 | | $399,863 62 | | $20,376 33 |
| $8,740 00 | | $7,999 98 | | $740 02 | |
| 173,375 00 | | 171,039 47 | | 2,335 53 | |
| 15,840 00 | | 20,518 28 | | *4,678 28 | |
| 2,050 00 | | 1,974 98 | | 75 02 | |
| 1,385 00 | | 867 15 | | 517 85 | |
| | $201,390 00 | | $202,399 86 | | *$1,009 86 |
| $103,440 00 | | $101,074 85 | | $2,365 15 | |
| 2,824,543 84 | | 2,783,764 02 | | 40,779 82 | |
| 721,885 00 | | 709,142 05 | | 12,742 95 | |
| 33,150 00 | | 29,742 13 | | 3,407 87 | |
| 68,365 00 | | 67,195 87 | | 1,169 13 | |
| 106,920 00 | | 103,972 09 | | 2,947 91 | |
| | $3,858,303 84 | | $3,794,891 01 | | $63,412 83 |
| | 36,550 00 | | 34,561 77 | | 1,988 23 |
| | $3,894,853 84 | | $3,829,452 78 | | $65,401 06 |

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BUREAU OF LAMPS

Statement Showing Total Number of Lamps

| | Electric. | | | | |
|---|---|---|---|---|---|
| | Arc. | | | | |
| | 500 Watt (Twin). | 450 Watt. | 400 Watt. | 325 Watt. | 325 and 450 Watt. |
| Manhattan | 209 | 4,283 | .... | 24 | .... |
| | .... | *3,962 | .... | *24 | .... |
| The Bronx | .... | 1,670 | 782 | .... | .... |
| | .... | *1,555 | *760 | .... | .... |
| Brooklyn | .... | 816 | .... | .... | 4,607 |
| | .... | .... | .... | .... | *5,348 |
| Queens | .... | .... | .... | 2,320 | .... |
| | .... | .... | .... | *2,450 | .... |
| Richmond | .... | 699 | .... | .... | .... |
| | .... | *664 | .... | .... | .... |
| Total number of each kind of lamp. | 209 | 7,468 | 782 | 2,344 | 4,607 |
| | .... | *6,181 | *760 | *2,474 | *5,348 |

*Indicates December 31, 1907.

Arc, 15,410; incandescent, 6,524; gas, 44,057; naphtha, 3,336.

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AND LIGHTING.

in Greater New York December 31, 1908.

| Electric. | | | | Gas. | | Naphtha. | | | |
|---|---|---|---|---|---|---|---|---|---|
| Incandescent. | | | | | | | | | |
| 90 and 100 Watt. | 81 Watt Tungsten. | 54 Watt Tungsten. | 90 and 100 Watt, Inc. and 54 W. T. | Mantle, 60 C. P. | Open Flame, 12 C. P. | Mantle, 60 C. P. | Open Flame, 12 C. P. | Total in Each Borough. | Acreage. |
| 148 | 313 | 59 | .... | 14,689 | 40 | 862 | .... | 20,627 | |
| *147 | .... | .... | .... | *15,423 | *75 | *1,119 | .... | *20,750 | 14,038 |
| 20 | 92 | 411 | .... | 6,203 | 86 | 1,788 | .... | 11,052 | |
| *390 | .... | .... | .... | *5,992 | *88 | *1,888 | .... | *10,673 | 26,017 |
| .... | .... | .... | .... | 18,199 | 2 | 656 | 12 | 24,292 | |
| .... | .... | .... | .... | *15,340 | *2,393 | *656 | *12 | *23,749 | 49,680 |
| 28 | 429 | .... | 1,280 | 4,603 | .... | 18 | .... | 8,678 | |
| *275 | .... | .... | .... | *4,323 | .... | *706 | .... | *7,754 | 82,883 |
| 3,744 | .... | .... | .... | 235 | .... | .... | .... | 4,678 | |
| *3,933 | .... | .... | .... | .... | .... | .... | .... | *4,597 | 36,600 |
| 3,940 | 834 | 470 | 1,280 | 43,929 | 128 | 3,324 | 12 | 69,327 | |
| *4,745 | .... | .... | .... | *41,078 | *2,556 | *4,369 | *12 | *67,523 | 209,218 |

Summary.

| | |
|---|---|
| Electric | 21,934 |
| Gas | 44,057 |
| Naphtha | 3,336 |
| Total | 69,327 |

In addition there are:

23 450-watt electric arc lamps furnished free by the New York Edison Company.

9 450-watt electric arc lamps furnished free by the New York Edison Company, one being in the Edison District and eight in that of the Westchester Lighting Company.

114 electric arc lamps, of which 29 are allowed by the Edison Electric Illuminating Company, and 85 are contested.

25 325-watt arc lamps, and

14 90-100-watt incandescent lamps, furnished free by the New York and Queens Electric Light and Power Company.



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## BUREAU OF LAMPS AND LIGHTING.

### BOROUGHS OF MANHATTAN AND THE BRONX.

Cost of Lighting Public Street Lamps in the Boroughs of Manhattan and The Bronx During the Year 1908—By Companies.

New York Edison Company—Electric Arc Lighting, Borough of Manhattan.

| Month. | Number of Lamps and Price Per Lamp Per Annum. 450-Watt. No. | 450-Watt. Price. | 250-Watt Twin. No. | 250-Watt Twin. Price. | 325-Watt. No. | 325-Watt. Price. | Outages. | Cost of Lighting. |
|---|---|---|---|---|---|---|---|---|
| January | 3,756 | $100 00 | *208 | $130 00 | 24 | $90 00 | $74 31 | $34,107 50 |
| February | 3,758 | 100 00 | 208 | 130 00 | 24 | 90 00 | 81 46 | 30,801 58 |
| March | 3,758 | 100 00 | 208 | 130 00 | 24 | 90 00 | 67 94 | 34,131 93 |
| April | 3,764 | 100 00 | 208 | 130 00 | 24 | 90 00 | 48 36 | 33,065 60 |
| May | 3,775 | 100 00 | 208 | 130 00 | 24 | 90 00 | 56 05 | 34,233 87 |
| June | 3,826 | 100 00 | 208 | 130 00 | 24 | 90 00 | 32 72 | 33,406 83 |
| July | 3,864 | 100 00 | 208 | 130 00 | 24 | 90 00 | 75 91 | 34,806 69 |
| August | 3,890 | 100 00 | 208 | 130 00 | 24 | 90 00 | 61 61 | 35,116 30 |
| September | 3,925 | 100 00 | 209 | 130 00 | 24 | 90 00 | 56 38 | 34,282 22 |
| October | 4,002 | 100 00 | 209 | 130 00 | 24 | 90 00 | 60 52 | 35,846 81 |
| November | 4,117 | 100 00 | 209 | 130 00 | 24 | 90 00 | 74 86 | 35,389 11 |
| December | 4,283 | 100 00 | 209 | 130 00 | 24 | 90 00 | 116 91 | 37,730 18 |
| Total | | | | | | | $807 03 | $412,918 62 |

*416 actual lamps, two per post.

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New York Edison Company—Electric Incandescent Lighting, Borough of Manhattan.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 143 | $22 50 | ..... | $273 08 |
| February | 143 | 22 50 | $0 06 | 255 40 |
| March | 143 | 22 50 | ..... | 273 08 |
| April | 143 | 22 50 | 19 | 264 07 |
| May | 143 | 22 50 | ..... | 273 07 |
| June | 141 | 22 50 | 12 | 260 94 |
| July | 141 | 22 50 | ..... | 269 26 |
| August | 141 | 22 50 | ..... | 269 26 |
| September | 141 | 22 50 | ..... | 261 31 |
| October | 143 | 22 50 | ..... | 273 08 |
| November | 143 | 22 50 | ..... | 264 26 |
| December | 143 | 22 50 | ..... | 273 08 |
| | †302 | 30 00 | 5 58 | 217 10 |
| Total | | | $5 95 | $3,426 99 |

*90 to 100 Watt, 25 candle power.

†81 Watt Tungsten.

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United Electric Light and Power Company—Electric Incandescent Lighting, Borough of Manhattan.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 4 | $22 50 | ..... | $7 50 |
| February | 4 | 22 50 | ..... | 7 50 |
| March | 4 | 22 50 | ..... | 7 50 |
| April | 5 | 22 50 | ..... | 8 12 |
| May | 5 | 22 50 | ..... | 9 37 |
| June | 5 | 22 50 | ..... | 9 38 |
| July | 5 | 22 50 | ..... | 9 37 |
| August | 5 | 22 50 | ..... | 9 38 |
| September | 5 | 22 50 | ..... | 9 37 |
| October | 5 | 22 50 | ..... | 9 38 |
| November | 5 | 22 50 | ..... | 9 37 |
| December | 5 | 22 50 | ..... | 9 38 |
| | †59 | 22 50 | ..... | 55 38 |
| | ‡11 | 30 00 | ..... | 18 99 |
| Total | | | | $179 99 |

*90 to 100 Watt, 25 candle power.

†54 Watt Tungsten lamps.

‡81 Watt Tungsten lamps.

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New York Edison Company—Electric Arc Lighting, Borough of The Bronx.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 1,573 | $100 00 | $172 46 | $13,206 86 |
| February | 1,574 | 100 00 | 133 13 | 12,001 55 |
| March | 1,575 | 100 00 | 116 01 | 13,341 67 |
| April | 1,575 | 100 00 | 159 44 | 12,851 39 |
| May | 1,577 | 100 00 | 179 03 | 13,283 58 |
| June | 1,583 | 100 00 | 100 13 | 12,956 73 |
| July | 1,596 | 100 00 | 129 72 | 13,455 90 |
| August | 1,602 | 100 00 | 106 71 | 13,544 93 |
| September | 1,602 | 100 00 | 183 27 | 13,049 48 |
| October | 1,630 | 100 00 | 165 19 | 13,660 15 |
| November | 1,646 | 100 00 | 112 58 | 13,372 49 |
| December | 1,671 | 100 00 | 183 56 | 13,840 93 |
| Total | | | $1,741 23 | $158,565 66 |

*450 Watt.

New York Edison Company—Electric Incandescent Lighting, Borough of The Bronx.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 374 | $25 00 | $0 89 | $793 30 |
| February | 373 | 25 00 | 61 | 740 01 |
| March | 373 | 25 00 | 72 | 791 35 |
| April | 373 | 25 00 | 48 | 766 04 |
| May | 373 | 25 00 | 41 | 791 66 |
| June | 375 | 25 00 | 27 | 766 80 |
| July | 376 | 25 00 | 14 | 797 95 |
| August | 376 | 25 00 | 38 | 798 06 |
| September | 381 | 25 00 | 38 | 774 01 |
| October | 387 | 25 00 | 93 | 815 52 |
| November | 387 | 25 00 | 14 | 795 15 |
| December | 415 | 25 00 | 28 | 867 46 |
| Total | | | $5 63 | $9,497 31 |

*90 to 100 Watt, 25 candle power.

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Westchester Lighting Company—Electric Incandescent Lighting, Borough of The Bronx.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 16 | $25 00 | ..... | $33 33 |
| February | 16 | 25 00 | $0 27 | 33 06 |
| March | 16 | 25 00 | ..... | 33 33 |
| April | 16 | 25 00 | 2 01 | 31 32 |
| May | 16 | 25 00 | 14 | 33 19 |
| June | 16 | 25 00 | 44 | 32 89 |
| July | 16 | 25 00 | 1 14 | 32 19 |
| August | 16 | 25 00 | ..... | 33 33 |
| September | 16 | 25 00 | 1 26 | 32 07 |
| October | 16 | 25 00 | ..... | 33 33 |
| November | 16 | 25 00 | 07 | 33 26 |
| December | 16 | 25 00 | 27 | 33 06 |
| Total | | | $5 60 | $394 36 |

*90 to 100 Watt, 25 candle power.

Bronx Gas and Electric Company—Electric Arc Lighting, Borough of The Bronx.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 761 | $105 30 | $2 59 | $6,780 51 |
| February | 761 | 105 30 | 6 90 | 6,342 35 |
| March | 761 | 105 30 | 3 16 | 6,783 97 |
| April | 761 | 105 30 | 19 13 | 6,549 06 |
| May | 764 | 105 30 | 36 82 | 6,771 02 |
| June | 768 | 105 30 | 8 20 | 6,595 66 |
| July | 769 | 105 30 | 10 45 | 6,832 20 |
| August | 777 | 105 30 | 13 53 | 6,858 75 |
| September | 771 | 105 30 | 20 56 | 6,685 73 |
| October | 777 | 105 30 | 75 36 | 6,854 73 |
| November | 781 | 105 30 | 26 02 | 6,696 38 |
| December | 782 | 105 30 | 17 12 | 6,951 25 |
| Total | | | $239 84 | $80,701 35 |

*400 Watt.

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## SCHEDULE I.—G.

Bronx Gas and Electric Company—Incandescent Electric Lighting, Borough of The Bronx.

| Month. | Number of Lamps.* | Price Per Lamp Per Year. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | .. | ..... | ..... | ..... |
| February | .. | ..... | ..... | ..... |
| March | .. | ..... | ..... | ..... |
| April | .. | ..... | ..... | ..... |
| May | 2 | $26 00 | ..... | $0 85 |
| June | 2 | 26 00 | ..... | 4 28 |
| July | 12 | 26 00 | ..... | 21 79 |
| August | 34 | 26 00 | ..... | 60 45 |
| September | 39 | 26 00 | $0 28 | 74 95 |
| October | 44 | 26 00 | 35 | 89 48 |
| November | 47 | 26 00 | ..... | 99 68 |
| December | 92 | 26 00 | 50 | 164 19 |
| Total | | | $1 13 | $515 67 |

*81-watt Tungsten.

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## SCHEDULE I.—H.

Total Cost of Lighting Public Electric Lamps in the Boroughs of Manhattan and The Bronx During the Year 1908.

| | Outages Deducted. | | Net. | |
|---|---|---|---|---|
| **Borough of Manhattan.** | | | | |
| New York Edison Company— | | | | |
| Arc | $807 03 | | $412,918 62 | |
| Incandescent | 5 95 | | 3,426 99 | |
| United Electric Light and Power Company— | | | | |
| Incandescent | ..... | | 179 99 | |
| | | $812 98 | | $416,525 60 |
| **Borough of The Bronx.** | | | | |
| New York Edison Company— | | | | |
| Arc | $1,741 23 | | $158,565 66 | |
| Incandescent | 5 63 | | 9,497 31 | |
| Westchester Lighting Company— | | | | |
| Incandescent | 5 60 | | 394 36 | |
| Bronx Gas and Electric Company— | | | | |
| Arc | 239 84 | | 80,701 35 | |
| Incandescent | 1 13 | | 515 67 | |
| | | 1,993 43 | | 249,674 35 |
| Total electric | | $2,806 41 | | $666,199 95 |

Burning hours, 3,962 per year for all electric lamps.

All equipment, posts, lamps and erection supplied by company, except Tungsten posts in parks, which are supplied by the City.

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## SCHEDULE II.

Welsbach Street Lighting Company of America—Gas Lamps (Maintenance Only), Borough of Manhattan.

| Month. | Number of Lamps. | | Price Per Lamp Per Annum. | | Cost. |
|---|---|---|---|---|---|
| | Open Flame. | Mantle. | Open Flame. | Mantle. | |
| January | 75 | 15,383 | $6 00 | $12 00 | $15,347 50 |
| February | 75 | 15,355 | 6 00 | 12 00 | 15,188 78 |
| March | 75 | 15,380 | 6 00 | 12 00 | 15,335 49 |
| April | 76 | 15,379 | 6 00 | 12 00 | 15,345 38 |
| May | 42 | 15,362 | 6 00 | 12 00 | 15,340 61 |
| June | 42 | 15,349 | 6 00 | 12 00 | 15,321 38 |
| July | 42 | 15,324 | 6 00 | 12 00 | 15,317 79 |
| August | 42 | 15,308 | 6 00 | 12 00 | 15,260 05 |
| September | 42 | 15,290 | 6 00 | 12 00 | 15,241 78 |
| October | 41 | 15,142 | 6 00 | 12 00 | 15,193 42 |
| November | 41 | 14,957 | 6 00 | 12 00 | 15,008 91 |
| December | 40 | 14,685 | 6 00 | 12 00 | 14,778 18 |
| Total | | | | | $182,679 27 |

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SCHEDULE

Consolidated Gas Company—Gas

| Month. | Number of Lamps. | |
|---|---|---|
| | *Open Flame. | †Mantle. |
| January | 75 | 15,383 |
| February | 75 | 15,355 |
| March | 75 | 15,380 |
| April | 76 | 15,379 |
| May | 42 | 15,362 |
| June | 42 | 15,349 |
| July | 42 | 15,324 |
| August | 42 | 15,308 |
| September | 42 | 15,290 |
| October | 41 | 15,142 |
| November | 41 | 14,957 |
| December | 40 | 14,685 |
| Total | | |

* Nominal candle power, 13.2. Consumption by contract, 3 cubic feet.

† Nominal candle power, 60. Consumption by governor, 3½ cubic feet.

(For Maintenance, see Schedule II.)

Price of gas, 75 cents per 1,000 cubic feet (statutory). Gas, 22 candle power.

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II.—A.

Lamps, Borough of Manhattan.

| Price Per Lamp Per Annum. *Open Flame. | †Mantle. | Outages. | Repairs. | Painting Lamp-posts. | Gas. | Cost of Lighting. |
|---|---|---|---|---|---|---|
| $8 89 | $10 40025 | $77 99 | $260 00 | ..... | $13,348 78 | $13,608 78 |
| 8 89 | 10 40025 | 205 88 | 261 00 | ..... | 13,324 59 | 13,585 59 |
| 8 89 | 10 40025 | 74 92 | 577 50 | ..... | 13,346 44 | 13,923 94 |
| 8 89 | 10 40025 | 75 11 | 933 50 | ..... | 13,346 30 | 14,279 80 |
| 8 89 | 10 40025 | 52 99 | 936 00 | ..... | 13,306 45 | 14,242 45 |
| 8 89 | 10 40025 | 52 86 | 821 50 | ..... | 13,295 12 | 14,116 62 |
| 8 89 | 10 40025 | 43 63 | 1,022 50 | ..... | 13,279 82 | 14,302 32 |
| 8 89 | 10 40025 | 73 69 | 938 00 | ..... | 13,259 78 | 14,197 78 |
| 8 89 | 10 40025 | 74 22 | 695 00 | ..... | 13,244 23 | 13,939 23 |
| 8 89 | 10 40025 | 67 74 | 1,100 20 | ..... | 13,115 58 | 14,215 78 |
| 8 89 | 10 40025 | 63 26 | 1,545 00 | ..... | 12,955 64 | 14,500 64 |
| 8 89 | 10 40025 | 58 66 | 1,271 00 | $2,905 60 | 12,719 89 | 16,896 49 |
| ..... | | $920 95 | $10,361 20 | $2,905 60 | $158,542 62 | $171,809 42 |

SCHEDULE II.-B.

Welsbach Street Lighting Company of America—Gas Lamps (Maintenance Only), Borough of The Bronx.

| Month. | Number of Lamps. Open Flame. | Mantle. | Price Per Lamp Per Annum. Open Flame. | Mantle. | Cost. |
|---|---|---|---|---|---|
| January..... | 88 | 5,985 | $6 00 | $12 00 | $6,014 43 |
| February..... | 88 | 5,980 | 6 00 | 12 00 | 5,993 84 |
| March..... | 88 | 5,978 | 6 00 | 12 00 | 6,009 75 |
| April..... | 88 | 5,977 | 6 00 | 12 00 | 6,015 61 |
| May..... | 88 | 5,971 | 6 00 | 12 00 | 6,004 12 |
| June..... | 88 | 6,009 | 6 00 | 12 00 | 6,022 96 |
| July..... | 88 | 6,043 | 6 00 | 12 00 | 6,066 81 |
| August..... | 87 | 6,075 | 6 00 | 12 00 | 6,022 30 |
| September..... | 87 | 6,121 | 6 00 | 12 00 | 6,077 00 |
| October..... | 87 | 6,123 | 6 00 | 12 00 | 6,161 67 |
| November..... | 86 | 6,160 | 6 00 | 12 00 | 6,170 71 |
| December..... | 86 | 6,203 | 6 00 | 12 00 | 6,227 80 |
| Total..... | | | | | $72,787 00 |

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Consolidated Gas Company—Gas

| Month. | Number of Lamps. | |
|---|---|---|
| | Open Flame. | Mantle. |
| January | 88 | 5,985 |
| February | 88 | 5,980 |
| March | 88 | 5,978 |
| April | 88 | 5,977 |
| May | 88 | 5,971 |
| June | 88 | 6,009 |
| July | 88 | 6,043 |
| August | 87 | 6,075 |
| September | 87 | 6,121 |
| October | 87 | 6,123 |
| November | 86 | 6,160 |
| December | 86 | 6,203 |
| Total | | |

Same kind of lamps as Consolidated Gas Company, Borough of Manhattan. See Schedule II.–A. For Maintenance, see Schedule II.-B.

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Lamps, Borough of The Bronx.

| Price Per Lamp Per Annum. Open Flame. | Mantle. | Outages. | Repairs. | Painting Lamp-posts. | Gas. | Cost of Lighting. |
|---|---|---|---|---|---|---|
| $8 89 | $10 40025 | $17 97 | $94 50 | ..... | $5,237 23 | $5,331 73 |
| 8 89 | 10 40025 | 32 47 | 3 50 | ..... | 5,233 74 | 5,237 24 |
| 8 89 | 10 40025 | 12 57 | 30 00 | ..... | 5,231 18 | 5,261 18 |
| 8 89 | 10 40025 | 9 63 | 363 00 | ..... | 5,230 31 | 5,593 31 |
| 8 89 | 10 40025 | 10 07 | 384 50 | ..... | 5,225 13 | 5,609 63 |
| 8 89 | 10 40025 | 6 30 | 630 25 | ..... | 5,238 17 | 5,868 42 |
| 8 89 | 10 40025 | 6 83 | 516 50 | ..... | 5,300 39 | 5,816 89 |
| 8 89 | 10 40025 | 74 14 | 479 00 | ..... | 5,314 26 | 5,793 26 |
| 8 89 | 10 40025 | 44 30 | 729 00 | ..... | 5,354 01 | 6,083 01 |
| 8 89 | 10 40025 | 11 58 | 479 00 | ..... | 5,355 75 | 5,834 75 |
| 8 89 | 10 40025 | 10 85 | 515 00 | ..... | 5,386 97 | 5,901 97 |
| 8 89 | 10 40025 | 1 52 | 663 00 | $1,528 25 | 5,421 92 | 7,613 17 |
| ..... | ..... | $238 23 | $4,887 25 | $1,528 25 | $63,529 06 | $69,944 56 |

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Total Cost of Lighting Public Gas Lamps in the Boroughs of Manhattan and The Bronx, During the Year 1908.

| | Outage Deductions. | Cost of Lighting. Maintenance. | Cost of Lighting. Gas. | Repairs. | Total. |
|---|---|---|---|---|---|
| Borough of Manhattan— | | | | | |
| Welsbach Street Lighting Company of America.. | ..... | $182,679 27 | ..... | ..... | $182,679 27 |
| Consolidated Gas Company | $920 95 | ..... | $158,542 82 | $13,266 80 | 171,809 42 |
| Total, Manhattan. | $920 95 | $182,679 27 | $158,542 62 | $13,266 80 | $354,488 69 |
| Borough of The Bronx— | | | | | |
| Welsbach Street Lighting Company of America.. | ..... | $72,787 00 | ..... | ..... | $72,787 00 |
| Consolidated Gas Company | $238 23 | ..... | $63,529 06 | $6,415 50 | 69,944 56 |
| Total, The Bronx. | $238 23 | $72,787 00 | $63,529 06 | $6,415 50 | $142,731 56 |
| Total, gas..... | $1,159 18 | $255,466 27 | $222,071 68 | $19,682 30 | $497,220 25 |

Lighting hours, 3,962 for all gas lamps per annum. All mantle lamps furnished, put in place and maintained by company. City supplies all open flame lamps, all posts, and pays for erection.

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Welsbach Street Lighting Company of America—Naphtha Mantle Lamps, Borough of Manhattan.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 1,119 | $28 20 | $34 03 | $2,595 62 |
| February | 1,119 | 28 20 | 19 29 | 2,610 36 |
| March | 1,119 | 28 20 | 23 15 | 2,606 50 |
| April | 1,119 | 28 20 | 26 49 | 2,603 16 |
| May | 1,119 | 28 20 | 28 23 | 2,599 52 |
| June | 1,126 | 28 20 | 11 09 | 2,633 37 |
| July | 1,125 | 28 20 | 13 91 | 2,631 58 |
| August | 1,119 | 28 20 | 32 17 | 2,609 46 |
| September | 1,105 | 28 20 | 52 80 | 2,555 70 |
| October | 1,093 | 28 20 | 19 25 | 2,560 22 |
| November | 1,077 | 28 20 | 15 69 | 2,537 59 |
| December | 862 | 28 20 | 22 72 | 2,334 33 |
| Total | | | $298 82 | $30,877 41 |

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Welsbach Street Lighting Company of America—Naphtha Mantle Lamps, Borough of The Bronx.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 1,907 | $28 20 | $31 76 | $4,423 77 |
| February | 1,930 | 28 20 | 37 12 | 4,495 30 |
| March | 1,922 | 28 20 | 34 72 | 4,489 86 |
| April | 1,921 | 28 20 | 15 82 | 4,499 48 |
| May | 1,920 | 28 20 | 13 19 | 4,500 02 |
| June | 1,888 | 28 20 | 12 92 | 4,473 46 |
| July | 1,880 | 28 20 | 13 42 | 4,412 47 |
| August | 1,871 | 28 20 | 336 85 | 4,072 81 |
| September | 1,863 | 28 20 | 103 28 | 4,291 69 |
| October | 1,856 | 28 20 | 22 59 | 4,347 66 |
| November | 1,828 | 28 20 | 13 15 | 4,326 67 |
| December | 1,788 | 28 20 | 43 32 | 4,190 85 |
| Total | | | $678 14 | $52,524 04 |

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## BUREAU OF LAMPS AND LIGHTING.

### BOROUGHS OF MANHATTAN AND THE BRONX.

Total Cost of Lighting Public Naphtha Lamps in the Boroughs of Manhattan and The Bronx During the Year 1908.

| | Outage. | Total. |
|---|---|---|
| Borough of Manhattan— | | |
| Welsbach Street Lighting Company of America..... | $298 82 | $30,877 41 |
| Borough of The Bronx— | | |
| Welsbach Street Lighting Company of America..... | 678 14 | 52,524 04 |
| Total..... | $976 96 | $83,401 45 |

Burning hours, 3,962 per annum. All equipment, posts, lamps and erection supplied by company at prices given. Nominally 60 candle-power.

Total Cost of Lighting Public Street Lamps in the Boroughs of Manhattan and The Bronx During the Year 1908.

| | Manhattan. | The Bronx. | Total. |
|---|---|---|---|
| Electric ..... | $416,525 60 | $249,674 35 | $666,199 95 |
| Gas ..... | 354,488 69 | 142,731 56 | 497,220 25 |
| Naphtha ..... | 30,877 41 | 52,524 04 | 83,401 45 |
| Total ..... | $801,891 70 | $444,929 95 | $1,246,821 65 |

Burning hours, 3,962 per annum.

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Cost of Electric Lighting in Public Buildings in the Bor

| Department. | Manhattan. | | Total. |
|---|---|---|---|
| | New York Edison Company. | United Electric Light and Power Company. | |
| Education | $55,945 91 | $43,590 18 | $99,536 09 |
| Fire | 10,018 73 | 1,022 34 | 11,041 07 |
| Police | 10,636 61 | ..... | 10,636 61 |
| Charities | ..... | 3,709 48 | 3,709 48 |
| Correction | 3,140 69 | ..... | 3,140 69 |
| Health | 12,998 50 | ..... | 12,998 50 |
| Parks | 2,914 33 | 438 77 | 3,353 10 |
| Hospitals | 1,576 77 | 11,185 52 | 12,762 29 |
| Street Cleaning | 2,600 39 | ..... | 2,600 39 |
| City College | 254 85 | ..... | 254 85 |
| Normal College | 770 76 | ..... | 770 76 |
| Buildings, Department | 125 14 | ..... | 125 14 |
| Bridges | 10 83 | 239 30 | 250 13 |
| Borough President, Manhattan | ..... | 4,051 35 | 4,051 35 |
| Williamsburg Bridge | 20,000 00 | ..... | 20,000 00 |
| Brooklyn Bridge | 19,807 31 | ..... | 19,807 31 |
| Public Buildings | 26,245 90 | 143 08 | 26,388 98 |
| Public Armories | 31,378 62 | 775 21 | 32,153 83 |
| Total | $198,425 34 | $65,155 23 | $263,580 57 |

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oughs of Manhattan and The Bronx During the Year 1908.

| The Bronx. | | | | | |
|---|---|---|---|---|---|
| New York Edison Company. | Westchester Lighting Company. | Bronx Gas and Electric Company. | Total. | Total, Manhattan and The Bronx. | Consumption, Kilowatt Hours. |
| $7,912 72 | $675 30 | $212 00 | $8,800 02 | $108,336 11 | 1,441,523.8 |
| 1,614 83 | 339 70 | ..... | 1,954 53 | 12,995 60 | 172,142.3 |
| 3,360 71 | 1,206 50 | 104 50 | 4,671 71 | 15,308 32 | 199,740.9 |
| 1,425 52 | ..... | ..... | 1,425 52 | 5,135 00 | 68,466.7 |
| ..... | ..... | ..... | ..... | 3,140 69 | 41,875.9 |
| 5,962 21 | ..... | ..... | 5,962 21 | 18,960 71 | 252,809.5 |
| 348 52 | 12 70 | 227 52 | 588 74 | 3,941 84 | 51,757.0 |
| ..... | ..... | ..... | ..... | 12,762 29 | 170,163.9 |
| 468 89 | ..... | ..... | 468 89 | 3,069 28 | 40,923.7 |
| ..... | ..... | ..... | ..... | 254 85 | 3,398.0 |
| ..... | ..... | ..... | ..... | 770 76 | 10,276.8 |
| ..... | ..... | ..... | ..... | 125 14 | 1,668.5 |
| 659 25 | 15 00 | ..... | 674 25 | 924 38 | 12,275.1 |
| ..... | ..... | ..... | ..... | 4,051 35 | 54,018.0 |
| ..... | ..... | ..... | ..... | 20,000 00 | 571,428.6 |
| ..... | ..... | ..... | ..... | 19,807 31 | 264,097.4 |
| 1,404 07 | 105 70 | 7 40 | 1,517 17 | 27,906 15 | 371,705.0 |
| 686 70 | ..... | ..... | 686 70 | 32,840 53 | 437,873.7 |
| $23,843 42 | $2,354 90 | $551 42 | $26,749 74 | $290,330 31 | 4,166,144.8 |

| | Per Kilowatt Hour. |
|---|---|
| New York Edison and United Electric Light and Power Company..... | $0 07½ |
| Westchester Lighting Company, and Bronx Gas and Electric Company.... | 10 |
| New York Edison Company (Williamsburg Bridge)..... | 03½ |

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Cost of Gas Lighting in Public Buildings in the Boroughs

| Departments. | Consolidated Gas Company. | New Amsterdam Gas Company. | Standard Gas Light Company. |
|---|---|---|---|
| Education | $41,796 07 | $5,367 32 | $3,724 40 |
| Fire | 8,933 56 | 5,761 79 | ..... |
| Police | 9,172 66 | 4,877 40 | 2,068 11 |
| Charities | 1,455 29 | 20,026 58 | ..... |
| Correction | 2,843 94 | 11,038 79 | ..... |
| Health | 2,729 70 | ..... | ..... |
| Parks | 1,670 17 | ..... | 14 25 |
| Hospitals | 7,641 91 | ..... | ..... |
| Street Cleaning | 6,526 50 | 160 80 | 8 25 |
| Borough President, Manhattan | 110 39 | ..... | ..... |
| City College | 241 94 | ..... | ..... |
| Sewers | ..... | ..... | ..... |
| Normal College | 250 42 | ..... | ..... |
| Bridges | ..... | ..... | 28 43 |
| Public Buildings | 13,309 65 | 4,090 94 | 82 26 |
| Armories | 247 04 | 10,032 30 | ..... |
| Public Markets | 1,286 02 | 345 89 | ..... |
| Total | $98,215 26 | $61,701 81 | $5,925 70 |

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of Manhattan and The Bronx During the Year 1908.

| Mutual Gas Light Company. | Central Union Gas Company. | Northern Union Gas Company. | Westchester Lighting Company. | Bronx Gas and Electric Company. | Total at 75c. Per Thousand. | Consumption, Cubic Feet. |
|---|---|---|---|---|---|---|
| $6,474 63 | $4,452 44 | $1,598 26 | $149 48 | $378 83 | $63,941 43 | 85,255.200 |
| 150 75 | 1,485 74 | 479 33 | 388 06 | 112 11 | 17,311 34 | 23,081.800 |
| 1,107 22 | 752 63 | 184 42 | ..... | 292 12 | 18,454 56 | 24,606.100 |
| ..... | ..... | ..... | ..... | ..... | 21,481 87 | 28,642.500 |
| ..... | ..... | ..... | ..... | ..... | 13,882 73 | 18,510.800 |
| ..... | 474 15 | ..... | ..... | ..... | 3,203 85 | 4,271.800 |
| 487 57 | ..... | ..... | 135 75 | ..... | 2,307 74 | 3,077.000 |
| ..... | ..... | 409 07 | ..... | ..... | 8,050 98 | 10,734.600 |
| 524 99 | 416 77 | 156 89 | ..... | ..... | 7,794 20 | 10,392.300 |
| ..... | ..... | ..... | ..... | ..... | 110 39 | 147.200 |
| 387 30 | ..... | ..... | ..... | ..... | 629 24 | 839.000 |
| ..... | 101 02 | 68 08 | ..... | 49 72 | 218 82 | 291.800 |
| ..... | ..... | ..... | ..... | ..... | 250 42 | 333.900 |
| ..... | ..... | ..... | ..... | ..... | 28 43 | 37.900 |
| 205 49 | 108 43 | 2,423 61 | ..... | 46 55 | 20,266 93 | 27,022.600 |
| ..... | ..... | 521 97 | ..... | ..... | 10,801 31 | 14,401.700 |
| ..... | ..... | ..... | ..... | ..... | 1,631 91 | 2,175.900 |
| $9,337 95 | $7,791 18 | $5,841 63 | $673 29 | $879 33 | $190,366 15 | 253,821.600 |

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Total Cost of Lighting Public Buildings in the Boroughs of Manhattan and The Bronx During the Year 1908.

| | |
|---|---|
| Electric | $290,330 31 |
| Gas | 190,366 15 |
| Total | $480,696 46 |

Cost of Lighting Public Buildings in the Boroughs of Manhattan and The Bronx During the Year 1908.

| Position. | Salary. Monthly. | Salary. Payrolls. | Remarks. |
|---|---|---|---|
| 1 Inspector | $125 00 | $1,500 00 | |
| 1 Inspector | 125 00 | 1,350 00 | Increased from $1,200 to $1,500 per annum, July 1, 1908. |
| 2 Inspectors, each | 125 00 | 2,850 00 | Increased from $1,350 to $1,500 per annum, July 1, 1908. |
| 1 Inspector | 112 50 | 1,275 00 | Increased from $1,200 to $1,350 per annum, July 1, 1908. |
| 1 Inspector | 100 00 | 100 00 | Transferred to Borough of Brooklyn, February 1, 1908. |
| 1 Inspector | 100 00 | 206 45 | Appointed October 30, 1908. |
| 3 Inspector, each | 100 00 | 600 00 | Appointed November 1, 1908. |
| 1 Lighter of Markets | 30 00 | 360 00 | |
| 2 Lighters of Markets | 10 00 | 240 00 | |
| 1 Lighter of Markets | 10 00 | 50 00 | Dropped June 1, 1908. |
| 1 Lighter of Markets | 10 00 | 20 00 | Died, March 1, 1908. |
| Total | | $8,551 45 | |

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Cost of Lighting Public Buildings in the Boroughs of Manhattan and The Bronx During the Year 1908.

Welsbach Gas Lamp Company—Inspections, etc.

| | Welsbach Arc Lamps. | Incandescent Lamps. | Fittings, Reflex Lights, Installations, etc. | Total. |
|---|---|---|---|---|
| First quarter | $108 00 | $21 60 | ..... | $129 60 |
| Second quarter | 108 00 | 21 60 | ..... | 129 60 |
| Third quarter | 131 40 | 21 60 | ..... | 153 00 |
| Fourth quarter | 154 80 | 21 60 | $345 05 | 521 45 |
| Total | $502 20 | $86 40 | $345 05 | $933 65 |

Cost of Lighting Public Buildings in the Boroughs of Manhattan and The Bronx During the Year 1908.

Gas Consumers' Association—Rental of Gas Regulators.

| | | | |
|---|---|---|---|
| January | $659 51 | August | 658 49 |
| February | 664 07 | September | 656 29 |
| March | 666 09 | October | 654 79 |
| April | 651 07 | November | 661 81 |
| May | 659 90 | December | 662 99 |
| June | 660 99 | | |
| July | 660 99 | Total | $7,916 99 |

Miscellaneous.

| | |
|---|---|
| Pressure gauges | 11 25 |
| Total | $7,928 24 |

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Cost of Electric Power to Public Buildings in the Bor

| Department. | Manhattan. | | |
|---|---|---|---|
| | New York Edison Company. | United Electric Light and Power Company. | Total. |
| Education | $4,956 63 | $2,657 35 | $7,613 98 |
| Fire | 2,913 26 | ..... | 2,913 26 |
| Police | 482 70 | ..... | 482 70 |
| Charities | ..... | ..... | ..... |
| Correction | 16 55 | ..... | 16 55 |
| Health | 12,187 33 | ..... | 12,187 33 |
| Parks | 46 44 | ..... | 46 44 |
| Street Cleaning | 1,210 48 | ..... | 1,210 48 |
| Bridges | ..... | 84 60 | 84 60 |
| Public Buildings | 648 43 | ..... | 648 43 |
| Armories | 479 09 | ..... | 479 09 |
| City College | 30 | ..... | 30 |
| Hospitals | 1,214 40 | ..... | 1,214 40 |
| Total | $24,155 61 | $2,741 95 | $26,897 56 |

Rate, 6 cents per kilowatt hour.

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oughs of Manhattan and The Bronx During the Year 1908.

| The Bronx. | | | | |
|---|---|---|---|---|
| New York Edison Company. | Westchester Lighting Company. | Total. | Total, Manhattan and The Bronx. | Consumption, Kilowatt Hours. |
| $1,464 36 | $4 80 | $1,469 16 | $9,083 14 | 151,385.7 |
| ..... | ..... | ..... | 2,913 26 | 48,554.3 |
| ..... | ..... | ..... | 482 70 | 8,045.0 |
| 27 78 | ..... | 27 78 | 27 78 | 463.0 |
| ..... | ..... | ..... | 16 55 | 275.8 |
| 1,414 20 | ..... | 1,414 20 | 13,601 53 | 226,692.2 |
| ..... | ..... | ..... | 46 44 | 774.0 |
| 11 34 | ..... | 11 34 | 1,221 82 | 20,363.7 |
| 91 80 | ..... | 91 80 | 176 40 | 2,940.0 |
| 90 | ..... | 90 | 649 33 | 10,822.2 |
| ..... | ..... | ..... | 479 09 | 7,984.8 |
| ..... | ..... | ..... | 30 | 5.0 |
| ..... | ..... | ..... | 1,214 40 | 20,240.0 |
| $3,010 38 | $4 80 | $3,015 18 | $29,912 74 | 498,545.7 |

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Cost of Steam Heat in Public Buildings in the Boroughs of Manhattan and The Bronx During the Year 1908.

| Departments. | Cost. | Furnished By |
|---|---|---|
| Fourth District Municipal Court | $650 00 | N. W. Keane. |
| Sixth District Municipal Court | 400 00 | De Milt Dispensary. |
| *Public Buildings | 15,610 63 | New York Steam Company. |
| Total | $16,660 63 | |

* Rate decreasing with increase of consumption per 1,000 pounds steam.

Total Cost for Heat and Power in the Boroughs of Manhattan and The Bronx During the Year 1908.

| | |
|---|---|
| Electric power | $29,912 74 |
| Steam heat | 16,660 63 |
| Total | $46,573 37 |

Bureau Expenses in the Boroughs of Manhattan and The Bronx During the Year 1908.

| | |
|---|---|
| Cartages, horse and wagon hire | $4,166 40 |
| Inspectors' disbursements | 2,232 37 |
| Stenography and typewriting (special) | 855 42 |
| Miscellaneous supplies | 4,287 22 |
| Photometric stations (expenses) | 4,067 65 |
| Rental of storeroom | 900 00 |
| Payroll (Cleaner) | 360 00 |
| Automobile storage, repairs, etc | 1,729 76 |
| Fitting up office, Borough of The Bronx | 120 00 |
| Total | $18,718 82 |

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Salaries of Office Employees, Inspectors, etc., in the Boroughs of Manhattan and The Bronx, During the Year 1908.

| Position. | Salary. Monthly. | Salary. Payrolls. | Remarks. |
|---|---|---|---|
| 1 Chief Engineer..... | $625 00 | $6,666 62 | Increased from $5,000 to $7,500 per annum, May 1, 1908. |
| 1 Clerk ..... | 250 00 | 2,775 00 | Increased from $2,550 to $3,000 per annum, July 1, 1908. |
| 1 Clerk ..... | 162 50 | 1,800 00 | Increased from $1,650 to $1,950 per annum, July 1, 1908. |
| 1 Clerk ..... | 87 50 | 975 00 | Increased from $900 to $1,050 per annum, July 1, 1908. |
| 1 General Inspector.... | 187 50 | 2,250 00 | |
| 1 Stenographer and Typewriter..... | 100 00 | 1,200 00 | |
| 1 Stenographer and Typewriter.... | 100 00 | 1,050 00 | Increased from $900 to $1,200 per annum, July 1, 1908. |
| Total..... | | $16,716 62 | |

Salaries, Office of Chief Gas Examiner, in the Boroughs of Manhattan and The Bronx, During the Year 1908.

| Position. | Salary. Monthly. | Salary. Payrolls. | Remarks. |
|---|---|---|---|
| 1 Chief Gas Examiner.. | $250 00 | $3,000 00 | |
| 8 Gas Examiners, each. | 100 00 | 9,600 00 | |
| 1 Gas Examiner..... | 100 00 | 300 00 | Deceased. |
| 1 Gas Examiner..... | 100 00 | 1,125 80 | Appointed January 24, 1908. |
| 1 Gas Examiner..... | 100 00 | 1,100 00 | Appointed February 1, 1908. |
| 1 Gas Examiner..... | 100 00 | 445 16 | Appointed May 18, 1908; resigned October 1, 1908. |
| 1 Gas Examiner..... | 100 00 | 532 26 | Appointed July 22, 1908. |
| 1 Gas Examiner..... | 100 00 | 241 93 | Appointed October 19, 1908. |
| Total..... | | $16,345 15 | |

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Salaries of Office Force and Inspectors in the Boroughs of Manhattan and The Bronx, During the Year 1908.

| Position. | Salary. Monthly. | Salary. Payrolls. | Remarks. |
|---|---|---|---|
| 1 Clerk | $150 00 | $1,800 00 | |
| 1 Clerk | 100 00 | 1,125 00 | Increased from $1,050 to $1,200 per annum, July 1, 1908. |
| 1 Clerk | 87 50 | 900 00 | Increased from $750 to $1,050 per annum, July 1, 1908. |
| 1 Clerk | 75 00 | 825 00 | Increased from $750 to $900 per annum, July 1, 1908. |
| 1 Clerk | 75 00 | 685 89 | Increased from $750 to $900 per annum, July 1, 1908; appointed March 8, 1908. |
| 1 Clerk | 25 00 | 250 00 | Appointed March 1, 1908. |
| 1 Clerk | 50 00 | 70 00 | Appointed November 19, 1908. |
| 1 Clerk | 25 00 | 32 26 | Appointed November 1, 1908; leave of absence from December 1 to 22, 1908. |
| 2 Stenographers and Typewriters, each. | 100 00 | 2,400 00 | |
| 1 Typewriting Copyist. | 75 00 | 150 00 | Appointed November 1, 1908. |
| 1 Architectural Draftsman | 150 00 | 1,650 00 | Increased from $1,500 to $1,800 per annum, July 1, 1908. |
| 1 Topographical Draftsman | 112 50 | 1,275 00 | Increased from $1,200 to $1,350 per annum, July 1, 1908. |
| 1 Draftsman's Helper | 87 50 | 937 50 | Increased from $900 to $1,050 per annum, July 1, 1908. |
| 1 Junior Draftsman | 87 50 | 929 03 | Increased from $900 to $1,050 per annum, July 1, 1908. |
| 1 Automobile Engineman | 125 00 | 1,500 00 | |
| 2 General Inspectors each | 187 50 | 4,500 00 | |
| 1 Inspector | 137 50 | 1,650 00 | |
| 1 Inspector | 137 50 | 1,575 00 | Increased from $1,500 to $1,650 per annum, July 1, 1908. |
| 3 Inspectors, each | 125 00 | 4,500 00 | |
| 1 Inspector | 125 00 | 375 00 | Transferred to Borough of Queens, April 1, 1908. |
| 6 Inspectors, each | 112 50 | 8,100 00 | |
| 1 Inspector | 125 00 | 1,425 00 | Increased from $1,350 to $1,500 per annum, July 1, 1908. |
| 12 Inspectors, each | 112 50 | 15,300 00 | Increased from $1,200 to $1,350 per annum, July 1, 1908. |
| 1 Inspector | 100 00 | 1,200 00 | |
| 1 Inspector | 112 50 | 862 50 | Increased from $1,200 to $1,350 per annum, July 1, 1908; died September 11, 1908. |
| 1 Inspector | 100 00 | 810 00 | Appointed April 13, 1908; leave of absence from November 15 to 30, 1908. |
| 1 Inspector | 100 00 | 200 00 | Appointed November 1, 1908. |
| 1 Inspector | 100 00 | 173 33 | Appointed November 9, 1908. |
| Total | | $55,200 51 | |

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Cost of Testing Electric Meters for Private Consumers During the Year 1908.
As Per Contract with Columbia University.

| 1908. | Cost. | 1908. | Cost. |
|---|---|---|---|
| January | $125 00 | August | 125 00 |
| February | 125 00 | September | 125 00 |
| March | 125 00 | October | 125 00 |
| April | 125 00 | November | 125 00 |
| May | 125 00 | December | 125 00 |
| June | 125 00 | | |
| July | 125 00 | Total | $1,500 00 |

## SCHEDULE XIV.

Photometric Station Expenses During the Year 1908.

| | | |
|---|---|---|
| Original Revenue Bond Fund | | $20,000 00 |
| Expenditures during 1905 | $6,112 68 | |
| Expenditures during 1906 | 802 05 | |
| Expenditures during 1907 | 7,546 81 | |
| Expenditures during 1908 | 2,587 24 | |
| | | 17,048 78 |
| Balance to credit of Revenue Bond Fund, December 31, 1908 | | $2,951 22 |

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High Pressure Fire Service Pumping Stations.
Manhattan.

SCHEDULE XV.

New York Edison Company.

| 1908. | Bills Rendered. | Vouchered. | *Balances. |
|---|---|---|---|
| March | $2,633 00 | $2,633 00 | ..... |
| April | 6,120 50 | 4,550 00 | $1,570 50 |
| May | 5,565 50 | 4,550 00 | 1,015 50 |
| June | 5,319 58 | 4,550 00 | 769 58 |
| July | 6,256 46 | 6,256 46 | ..... |
| August 1 to 15 | 3,163 16 | 3,145 16 | 18 00 |
| August 16 to 31 | 3,528 84 | 3,354 84 | 174 00 |
| September | 9,755 00 | 6,500 00 | 3,255 00 |
| October | 6,617 00 | 6,500 00 | 117 00 |
| November | 6,693 00 | 6,500 00 | 193 50 |
| December | 7,235 00 | 6,500 00 | 735 00 |
| Total | $62,887 54 | $55,039 46 | $7,848 08 |

* These amounts are subject to adjustment when certification is finally made by the Chief Engineer of Water Supply.

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## SCHEDULE XVI.

### Summary of Expenditures and Liabilities, 1908.

| Company. | Vouchers Chargeable to Appropriations. | | | | |
|---|---|---|---|---|---|
| | Streets and Parks. | Repairs. | Public Buildings. | Heat and Power. | Total. |
| New York Edison Company..... | $584,408 58 | ..... | $222,268 76 | $27,165 99 | $833,843 33 |
| United Electric Light and Power Company..... | 179 99 | ..... | 65,155 23 | 2,741 95 | 68,077 17 |
| Westchester Lighting Company.... | 394 36 | ..... | 2,359 70 | ..... | 2,754 06 |
| Bronx Gas and Electric Company. | 81,217 02 | ..... | 551 42 | ..... | 81,768 44 |
| Welsbach Street Lighting Company of America..... | 338,867 72 | ..... | ..... | ..... | 338,867 72 |
| Consolidated Gas Company..... | ..... | $19,682 30 | ..... | ..... | 19,682 30 |
| New Amsterdam Gas Company.... | ..... | ..... | ..... | ..... | ..... |
| Standard Gas Light Company..... | ..... | ..... | ..... | ..... | ..... |
| Mutual Gas Light Company..... | ..... | ..... | ..... | ..... | ..... |
| Central Union Gas Light Company. | ..... | ..... | ..... | ..... | ..... |
| Northern Union Gas Company.... | ..... | ..... | ..... | ..... | ..... |
| Payroll No. 6..... | ..... | ..... | 8,551 45 | ..... | 8,551 45 |
| Welsbach Gas Lamp Company.... | ..... | ..... | 944 90 | ..... | 944 90 |
| Gas Consumers' Association..... | ..... | ..... | 7,916 99 | ..... | 7,916 99 |
| N. W. Keane..... | ..... | ..... | ..... | 650 00 | 650 00 |
| De Milt Dispensary..... | ..... | ..... | ..... | 400 00 | 400 00 |
| New York Steam Company..... | ..... | ..... | ..... | 15,610 63 | 15,610 63 |
| Total..... | $1,005,067 67 | $19,682 30 | $307,748 45 | $46,568 57 | $1,379,066 99 |

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| Company. | Outstanding Estimated Liabilities, 1908. | | | | |
|---|---|---|---|---|---|
| | Streets and Parks. | Repairs. | Public Buildings. | Heat and Power. | Total. |
| New York Edison Company..... | ..... | ..... | ..... | ..... | ..... |
| United Electric Light and Power Company..... | ..... | ..... | ..... | ..... | ..... |
| Westchester Lighting Company.... | ..... | ..... | $673 29 | ..... | $673 29 |
| Bronx Gas and Electric Company.. | ..... | ..... | 879 33 | ..... | 879 33 |
| Welsbach Street Lighting Company of America..... | ..... | ..... | ..... | ..... | ..... |
| Consolidated Gas Company..... | $222,071 68 | ..... | 98,215 26 | ..... | 320,286 94 |
| New Amsterdam Gas Company.... | ..... | ..... | 61,701 81 | ..... | 61,701 81 |
| Standard Gas Light Company..... | ..... | ..... | 5,925 70 | ..... | 5,925 70 |
| Mutual Gas Light Company..... | ..... | ..... | 9,337 95 | ..... | 9,337 95 |
| Central Union Gas Light Company. | ..... | ..... | 7,791 18 | ..... | 7,791 18 |
| Northern Union Gas Company..... | ..... | ..... | 5,841 63 | ..... | 5,841 63 |
| Payroll No. 6..... | ..... | ..... | ..... | ..... | ..... |
| Welsbach Gas Lamp Company..... | ..... | ..... | ..... | ..... | ..... |
| Gas Consumers' Association..... | ..... | ..... | ..... | ..... | ..... |
| N. W. Keane..... | ..... | ..... | ..... | ..... | ..... |
| De Milt Dispensary..... | ..... | ..... | ..... | ..... | ..... |
| New York Steam Company..... | ..... | ..... | ..... | ..... | ..... |
| Total..... | $222,071 68 | ..... | $190,366 15 | ..... | $412,437 83 |

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## Recapitulation, 1908 Appropriation Accounts.

| Appropriations. | | Funds Available. | Expenditures. | Balances. |
|---|---|---|---|---|
| Heat, Light and Power, Bureau of Lamps and Lighting— | | | | |
| Street and Park Lighting, 1908..... | $1,275,782 75 | | | |
| "Transfer From," Board of Estimate and Apportionment, June 25, 1909 | 25,000 00 | | | |
| | | $1,250,782 75 | | |
| Vouchers issued..... | $1,024,749 97 | | | |
| Outstanding estimated liabilities.... | 222,071 68 | | | |
| | | | $1,246,821 65 | $3,961 10 |
| Lighting Public Buildings, 1908..... | $455,000 00 | | | |
| "Transfer To," Board of Estimate and Apportionment, June 25, 1909.... | 43,200 00 | | | |
| | | 498,200 00 | | |
| Vouchers issued..... | $307,748 45 | | | |
| Outstanding estimated liabilities.... | 190,366 15 | | | |
| | | | 498,114 60 | 85 40 |
| Heat and Power for City Departments, etc., 1908..... | $36,940 00 | | | |
| "Transfer To," Board of Estimate and Apportionment, June 25, 1909.... | 10,000 00 | | | |
| | | 46,940 00 | | |
| Vouchers issued..... | | | 46,568 57 | 371 43 |
| Bureau Expenses, 1908..... | $22,650 00 | | | |
| "Transfer From," Board of Estimate and Apportionment, November 11, 1908..... $2,000 00 | | | | |
| "Transfer From," Board of Estimate and Apportionment, June 25, 1909 1,500 00 | | | | |
| | 3,500 00 | | | |
| | | 19,150 00 | | |
| Vouchers issued..... | | | 18,718 82 | 431 18 |
| Administration, Office of Chief Engineer, Salaries and Wages, 1908..... | $18,650 00 | | | |
| "Transfer From," Board of Estimate and Apportionment, November 23, 1908..... | 1,000 00 | | | |
| | | 17,650 00 | | |
| Vouchers issued..... | | | 16,716 62 | 933 38 |

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| Appropriations. | | Funds Available. | Expenditures. | Balances. |
|---|---|---|---|---|
| Heat, Light and Power, Bureau of Lamps and Lighting— | | | | |
| Administration, Office of Chief Gas Examiner, 1908... | | 17,400 00 | | |
| Vouchers issued..... | | | 16,345 15 | 1,054 85 |
| Salaries and Wages, 1908..... | $56,390 00 | | | |
| "Transfer From," Board of Estimate and Apportionment, November 23, 1908..... | 500 00 | | | |
| | | 55,890 00 | | |
| Vouchers issued..... | | | 55,200 51 | 689 49 |
| Administration, Laboratory for Testing Electric Meters, 1908..... | | 1,500 00 | | |
| Vouchers issued..... | | | 1,500 00 | ..... |
| High Pressure Fire Service, Reservation of Machinery and Current, 1908.. | $75,000 00 | | | |
| "Transfer From," Board of Estimate and Apportionment, June 25, 1909 | 12,000 00 | | | |
| | | 63,000 00 | | |
| Vouchers issued..... | $55,039 46 | | | |
| Outstanding estimated liabilities.... | 7,848 08 | | | |
| | | | 62,887 54 | 112 46 |
| Total..... | | $1,970,512 75 | $1,962,873 46 | $7,639 29 |
| Revenue Bond Fund for Operation and Maintenance of Nine Photometric Stations, and for Salaries of Gas Examiners, Authorized September 1, 1905, $20,000..... | | $5,538 46 | | |
| Vouchers issued..... | | | $2,587 24 | $2,951 22 |

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## BUREAU OF LAMPS AND LIGHTING.

### BOROUGH OF BROOKLYN.

Edison Electric Illuminating Company of Brooklyn, Electric Lighting—325 and 450 Watt Lamps.

| Month. | 325-Watt Lamps. | Price Per Annum. | 450-Watt Lamps. | Price Per Annum. | Cost of Lighting. |
|---|---|---|---|---|---|
| January | 211 | $90 00 | 4,329 | $100 00 | $37,200 06 |
| February | 211 | 90 00 | 4,343 | 100 00 | 33,579 46 |
| March | 211 | 90 00 | 4,335 | 100 00 | 37,353 40 |
| April | 211 | 90 00 | 4,335 | 100 00 | 36,142 08 |
| May | 211 | 90 00 | 4,366 | 100 00 | 37,435 10 |
| June | 211 | 90 00 | 4,383 | 100 00 | 36,530 50 |
| July | 211 | 90 00 | 4,388 | 100 00 | 37,839 88 |
| August | 211 | 90 00 | 4,408 | 100 00 | 37,923 50 |
| September | 211 | 90 00 | 4,408 | 100 00 | 36,802 59 |
| October | 211 | 90 00 | 4,396 | 100 00 | 37,931 46 |
| November | 211 | 90 00 | 4,389 | 100 00 | 36,430 03 |
| December | 211 | 90 00 | 4,396 | 100 00 | 37,852 27 |
| Total | | | | | $443,020 33 |

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Flatbush Gas Company, Electric Lighting, 350 Watt Lamps.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 806 | $97 50 | $6,539 95 |
| February | 806 | 97 50 | 6,541 01 |
| March | 806 | 97 50 | 6,516 18 |
| April | 806 | 97 50 | 6,544 49 |
| May | 806 | 97 50 | 6,513 39 |
| June | 809 | 97 50 | 6,564 47 |
| July | 810 | 97 50 | 6,556 63 |
| August | 810 | 97 50 | 6,566 09 |
| September | 812 | 97 50 | 6,577 56 |
| October | 814 | 97 50 | 6,596 44 |
| November | 815 | 97 50 | 6,603 66 |
| December | 816 | 97 50 | 6,615 98 |
| Total | | | $78,735 85 |

Total Cost of Electric Lighting Street Lamps, 1908.

| | |
|---|---|
| Edison Electric Illuminating Company | $443,020 33 |
| Flatbush Gas Company | 78,735 85 |
| Total | $521,756 18 |

Burning hours, 3,962 per annum (366 days). Equipment and service furnished by Company.

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Brooklyn Union Gas Company—Mantle Gas Lamps (Gas and Repairs to Lamp-posts Only).

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Repairs. | Cost of Lighting. | Total. |
|---|---|---|---|---|---|
| January | *12,897 | $10.40025 | $60 50 | $11,357 79 | $11,418 29 |
| February | 12,892 | 10.40025 | 186 50 | 10,611 03 | 10,797 53 |
| March | 12,903 | 10.40025 | 204 50 | 11,358 81 | 11,563 31 |
| April | 12,924 | 10.40025 | 533 00 | 11,001 57 | 11,534 57 |
| May | 12,936 | 10.40025 | 649 00 | 11,387 11 | 12,036 11 |
| June | 12,945 | 10.40025 | 768 00 | 11,036 84 | 11,804 84 |
| July | 13,003 | 10.40025 | 1,347 00 | 11,415 50 | 12,762 50 |
| August | 13,019 | 10.40025 | 566 00 | 11,449 43 | 12,015 43 |
| September | 13,025 | 10.40025 | 3,386 10 | 11,085 40 | 14,471 50 |
| October | 13,087 | 10.40025 | 897 00 | 11,506 49 | 12,403 49 |
| November | 13,181 | 10 40025 | 2,035 00 | 11,193 52 | 13,228 52 |
| December | 13,258 | 10.40025 | 742 00 | 11,636 18 | 12,378 18 |
| Total | | | $11,374 60 | $135,039 67 | $146,414 27 |

* Two open flame gas lamps; no maintenance.

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Brooklyn Borough Gas Company—Mantle Gas Lamps (Gas and Repairs to Lamp-posts Only).

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Repairs. | Cost of Lighting. | Total. |
|---|---|---|---|---|---|
| January | 281 | $10.40025 | ..... | $243 47 | $243 47 |
| February | 293 | 10.40025 | ..... | 254 14 | 254 14 |
| March | 297 | 10.40025 | ..... | 254 93 | 254 93 |
| April | 300 | 10.40025 | ..... | 258 85 | 258 85 |
| May | 300 | 10.40025 | ..... | 257 88 | 257 88 |
| June | 300 | 10.40025 | ..... | 259 14 | 259 14 |
| July | 300 | 10.40025 | ..... | 259 14 | 259 14 |
| August | 299 | 10.40025 | ..... | 258 52 | 258 52 |
| September | 324 | 10.40025 | $345 00 | 301 60 | 646 60 |
| October | 336 | 10.40025 | 120 00 | 244 89 | 364 89 |
| November | 337 | 10.40025 | ..... | 289 85 | 289 85 |
| December | 385 | 10.40025 | 228 50 | 312 63 | 541 13 |
| Total | | | $693 50 | $3,195 04 | $3,888 54 |

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New York and New Jersey Globe Gas Light Company, Ltd.—Maintenance of Welsbach Gas Lamps.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Repairs. | Cost of Lighting. | Total. |
|---|---|---|---|---|---|
| January | 13,176 | $13 32 | ..... | $14,619 47 | $14,619 47 |
| February | 13,183 | 13 32 | ..... | 14,617 29 | 14,617 29 |
| March | 13,198 | 13 32 | ..... | 14,639 64 | 14,639 64 |
| April | 13,222 | 13 32 | ..... | 14,655 56 | 14,655 56 |
| May | 13,234 | 13 32 | ..... | 14,677 87 | 14,677 87 |
| June | 13,243 | 13 32 | ..... | 14,701 84 | 14,701 84 |
| July | 13,301 | 13 32 | ..... | 14,715 41 | 14,715 41 |
| August | 13,316 | 13 32 | ..... | 14,757 04 | 14,757 04 |
| September | 13,347 | 13 32 | $60 00 | 14,769 67 | 14,829 67 |
| October | 13,421 | 13 32 | ..... | 14,861 65 | 14,861 65 |
| November | 13,516 | 13 32 | ..... | 14,945 33 | 14,945 33 |
| December | 13,641 | 13 32 | ..... | 15,070 50 | 15,070 50 |
| Total | | | $60 00 | $177,031 27 | $177,091 27 |

*Kings County Lighting Company—Mantle Gas Lamps.

| Month. | Number of Lamps. | Price Per Lamp Per Year. | Resetting. | Cost of Lighting. | Total. |
|---|---|---|---|---|---|
| January | 4,558 | $28 00 | | | |
| February | 4,558 | 28 00 | $1,343 95 | $31,674 00 | $33,017 95 |
| March | 4,558 | 28 00 | | | |
| April | 4,558 | 28 00 | | | |
| May | 4,558 | 28 00 | 1,965 30 | 31,724 57 | 33,689 87 |
| June | 4,558 | 28 00 | | | |
| July | 4,558 | 28 00 | | | |
| August | 4,558 | 28 00 | 815 65 | 32,069 83 | 32,885 48 |
| September | 4,558 | 28 00 | | | |
| October | 4,558 | 28 00 | | | |
| November | 4,558 | 28 00 | 4,579 70 | 32,060 11 | 36,639 81 |
| December | 4,558 | 28 00 | | | |
| Total | | | $8,704 60 | $127,528 51 | $136,233 11 |

* Special contract, lapsing in 1916.

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## BUREAU OF LAMPS AND LIGHTING.

### BOROUGH OF BROOKLYN.

Cost of Lighting Public Lamps in the Borough of Brooklyn During the Year 1908, by Companies.

Appropriation: Heat, Light and Power, Borough of Brooklyn, Bureau of Lamps and Lighting, Street and Park Lighting, 1908.

| Name and Service. | Amount. |
|---|---|
| Frank J. Gallagher, team hire, labor, etc..... | *$180 46 |

*Changing Kings County Lighting Company lamp-posts in Thirtieth Ward.

Total Cost of Gas Light

| | |
|---|---|
| Brooklyn Union Gas Company ..... | |
| Brooklyn Borough Gas Company ..... | |
| New York and New Jersey, Globe Gas Lighting Company..... | |
| Kings County Lighting Company ..... | |
| Frank J. Gallagher ..... | |
| Total..... | |

All lamps burn 3,962 hours per annum (366 days).

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ing, Street Lamps, 1908.

| Welsbach Mantle Lamps. | | | Resetting. | Repairs. | Team Hire, Etc. | Total. |
|---|---|---|---|---|---|---|
| Gas. | Maintenance. | Total. | | | | |
| $135,039 67 | ..... | $135,039 67 | ..... | $11,374 60 | ..... | $146,414 27 |
| 3,195 04 | ..... | 3,195 04 | ..... | 693 50 | ..... | 3,888 54 |
| ..... | $177,031 27 | 177,031 27 | ..... | 60 00 | ..... | 177,091 27 |
| ..... | ..... | 127,528 51 | $8,704 60 | ..... | ..... | 136,233 11 |
| ..... | ..... | ..... | ..... | ..... | $180 46 | 180 46 |
| ..... | ..... | $442,794 49 | $8.704 60 | $12,128 10 | $180 46 | $463,807 65 |

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Welsbach Street Lighting Company of America, Naphtha Welsbach Lamps.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 656 | $28 20 | $1,541 22 |
| February | 656 | 28 20 | 1,541 52 |
| March | 656 | 28 20 | 1,541 45 |
| April | 656 | 28 20 | 1,541 60 |
| May | 656 | 28 20 | 1,541 60 |
| June | 656 | 28 20 | 1,541 45 |
| July | 656 | 28 20 | 1,541 15 |
| August | 656 | 28 20 | 1,519 77 |
| September | 656 | 28 20 | 1,526 01 |
| October | 656 | 28 20 | 1,536 22 |
| November | 656 | 28 20 | 1,539 39 |
| December | 656 | 28 20 | 1,539 63 |
| Total | | | $18,451 01 |

All equipment supplied and maintained by Company.

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Welsbach Street Lighting Company of America, Plain Naphtha Lamps.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 12 | $22 50 | $22 50 |
| February | 12 | 22 50 | 22 50 |
| March | 12 | 22 50 | 22 50 |
| April | 12 | 22 50 | 22 50 |
| May | 12 | 22 50 | 22 50 |
| June | 12 | 22 50 | 22 50 |
| July | 12 | 22 50 | 22 50 |
| August | 12 | 22 50 | 22 50 |
| September | 12 | 22 50 | 22 50 |
| October | 12 | 22 50 | 22 50 |
| November | 12 | 22 50 | 22 50 |
| December | 12 | 22 50 | 22 50 |
| Total | | | $270 00 |

Total Cost of Naphtha, Lighting Street Lamps, 1908.

| | |
|---|---|
| Welsbach Street Lighting Company of America | $18,451 01 |
| Welsbach Street Lighting Company of America | 270 00 |
| Total | $18,721 01 |

Open flame naphtha lamps on Barren Island only. All equipment supplied and maintained by Company.

All lamps burn 3,962 hours per annum (366 days).

## RECAPITULATION.

Cost of Lighting Street Lamps During 1908.

| | |
|---|---|
| Electric—Schedule I | $521,756 18 |
| Naphtha—Schedule II | 18,721 01 |
| Gas—Schedule III | 463,807 65 |
| Total | $1,004,284 84 |

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Cost of Electric Lighting in Public Buildings in the Borough of Brooklyn During the Year 1908, by Companies and Departments.

Appropriation: Heat, Light and Power, Borough of Brooklyn, Bureau of Lamps and Lighting, Lighting Public Buildings, 1908.

| Departments. | *Edison Electric Illuminating Company. | †Flatbush Gas Company. | Total, Departments. | Consumption, Kilowatt Hours. |
|---|---|---|---|---|
| Armories | $15,482 74 | ..... | $15,482 74 | 162,976.2 |
| Education | 24,834 76 | $2,805 48 | 27,640 24 | 289,473.3 |
| Police | 7,686 48 | ..... | 7,686 48 | 80,910.3 |
| Fire | 2,972 09 | 335 84 | 3,307 93 | 34,643.6 |
| Charities | 4,237 71 | ..... | 4,237 71 | 44,607.5 |
| Street Cleaning | 3,392 49 | ..... | 3,392 49 | 35,710.4 |
| Health | 865 81 | 3,110 46 | 3,976 27 | 40,218.4 |
| Parks | 2,254 04 | 367 70 | 2,621 74 | 27,403.7 |
| Water Supply, Gas and Electricity | 1,384 52 | ..... | 1,384 52 | 14,573.9 |
| Bridges | 25 21 | ..... | 25 21 | 265.3 |
| Baths and Comfort Stations | 3,128 79 | ..... | 3,128 79 | 32,934.6 |
| Public Works | 23,683 78 | ..... | 23,683 78 | 249,303.0 |
| Total | $89,948 42 | $6,619 48 | $96,567 90 | 1,013,020.2 |

* 9½ cents per kilowatt hour. † 10 cents per kilowatt hour.

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Cost of Gas Lighting in Public Buildings in the Borough of Brooklyn During the Year 1908, by Companies and Departments.

Appropriation: Heat, Light and Power, Borough of Brooklyn, Bureau of Lamps and Lighting, Lighting Public Buildings, 1908.

| Departments. | *Brooklyn Union Gas Company. | *Brooklyn Borough Gas Company. | *Flatbush Gas Company. | †Kings County Lighting Company. | Total, Depart-ments. | Consump-tion, Kilowatt Hours. |
|---|---|---|---|---|---|---|
| Armories | $12,170 06 | ..... | ..... | ..... | $12,170 06 | 16,226.7 |
| Education | 14,474 58 | $154 87 | $557 68 | $713 00 | 15,900 13 | 20,962.5 |
| Police | 9,355 75 | 318 94 | 552 90 | 88 30 | 10,315 89 | 13,725.1 |
| Fire | 7,151 89 | 474 77 | 258 17 | 591 50 | 8,476 33 | 11,104.6 |
| Charities | 663 71 | 107 84 | 887 78 | ..... | 1,659 33 | 2,212.4 |
| Street Cleaning | 358 90 | ..... | 3 98 | 242 70 | 605 58 | 726.6 |
| Health | 213 56 | ..... | 3,545 15 | ..... | 3,758 71 | 5,011.6 |
| Parks | 104 42 | ..... | 27 82 | ..... | 132 24 | 176.3 |
| Water Supply, Gas and Electricity | 3,115 52 | 415 41 | ..... | 3 60 | 3,534 53 | 4,711.5 |
| Bridges | 74 44 | ..... | ..... | ..... | 74 44 | 99.3 |
| Photometric Stations | 37 30 | 30 | ..... | 13 10 | 50 70 | 63.2 |
| Disciplinary Training School | ..... | ..... | ..... | 2,064 20 | 2,064 20 | 2,064.2 |
| Baths and Comfort Stations | 432 77 | ..... | ..... | ..... | 432 77 | 577.3 |
| Correction | 2,291 65 | ..... | ..... | ..... | 2,291 65 | 3,055.5 |
| Sewers | 105 33 | ..... | ..... | ..... | 105 33 | 140.4 |
| Public Works | 1,575 49 | ..... | ..... | ..... | 1,575 49 | 2,100.6 |
| Total | $52,125 37 | $1,472 13 | $5,833 48 | $3,716 40 | $63,147 38 | 82,957.8 |

* 75 cents per 1,000 cubic feet. † $1 per 1,000 cubic feet, under special long-term contract.

Total Cost of Lighting Public Buildings, 1908.

| | |
|---|---|
| Electric | $96,567 90 |
| Gas | 63,147 38 |
| Gas Consumers' Association | 1,792 80 |
| Transit Development Company | 42 88 |
| Total | $161,550 96 |

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Cost of Electric Current Supplied for Power in the Borough of Brooklyn During the Year 1908, by Companies and Departments.

Appropriation: Heat, Light and Power, Borough of Brooklyn, Bureau of Lamps and Lighting, Heat and Power for City Departments, etc.

| Departments. | *Edison Electric Illuminating Company. | †Flatbush Gas Company. | Total, Departments. | Consumption, Kilowatt Hours. |
|---|---|---|---|---|
| Education | $6,348 94 | $1,018 21 | $7,367 15 | 115,997.7 |
| Police | 576 76 | ..... | 576 76 | 9,612.7 |
| Fire | 268 32 | ..... | 268 32 | 4,472.0 |
| Armories | 81 84 | ..... | 81 84 | 1,364.0 |
| Health | ..... | 33 58 | 33 58 | 335.8 |
| Charities | 225 52 | ..... | 225 52 | 3,758.6 |
| Water Supply, Gas and Electricity | 759 92 | ..... | 759 92 | 12,665.3 |
| Street Cleaning | 18 60 | ..... | 18 60 | 310.0 |
| Bridges | 201 26 | ..... | 201 26 | 3,354.3 |
| Parks | 54 | ..... | 54 | 9.0 |
| Public Works | 3,124 47 | ..... | 3,124 47 | 52,074.5 |
| Baths and Comfort Stations | 1,928 90 | ..... | 1,928 90 | 32,148.3 |
| Total | $13,535 07 | $1,051 79 | $14,586 86 | 236,102.2 |

* 6 cents per kilowatt hour. † 10 cents per kilowatt hour.

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Cost for Gas Power to Public Buildings in the Borough of Brooklyn During the Year 1908, by Companies and Departments.

Appropriation: Heat, Light and Power, Borough of Brooklyn, Bureau of Lamps and Lighting, Heat, and Power for City Departments, etc.

| Departments. | *Brooklyn Union Gas Company. | *Brooklyn Borough Gas Company. | *Flatbush Gas Company. | †Kings County Lighting Company. | Total, Departments. | Consumption, Cu. Ft. |
|---|---|---|---|---|---|---|
| Education | $1,397 13 | $89 73 | $195 48 | $454 80 | $2,137 14 | 2,697.9 |
| Fire | 421 23 | ..... | ..... | ..... | 421 23 | 561.6 |
| Armories | 323 35 | ..... | ..... | ..... | 323 35 | 431.1 |
| Charities | 5 27 | ..... | 8 10 | ..... | 13 37 | 17.8 |
| Water Supply, Gas and Electricity. | ..... | 26 71 | ..... | ..... | 26 71 | 35.6 |
| Sewers | ..... | 87 91 | ..... | ..... | 87 91 | 117.3 |
| Public Works | ..... | 30 31 | ..... | ..... | 30 31 | 40.4 |
| Total | $2,146 98 | $234 66 | $203 58 | $454 80 | $3,040 02 | 3,901.7 |

* 75 cents per 1,000 cubic feet. † $1 per 1,000 cubic feet, under special long-term contract.

Total Cost of Power to Public Buildings, 1908.

| | |
|---|---|
| Electric | $14,586 86 |
| Gas | 3,040 02 |
| Brooklyn Heights Railroad Company (account Department of Bridges) | 50 44 |
| Total | $17,677 32 |

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Bureau Expenses in the Borough of Brooklyn During the Year 1908.

| | | |
|---|---|---|
| Inspectors' disbursements | | $649 76 |
| Horse and wagon hire, etc | | 811 05 |
| Office supplies | | 256 30 |
| Photometric Stations— | | |
| Rents | $2,060 00 | |
| Telephones | 182 33 | |
| Equipment | 129 57 | |
| | | 2,311 27 |
| Total | | $4,089 01 |

Salaries of Office Employees and Inspectors in the Borough of Brooklyn During the Year 1908.

| Position. | Salary. Month. | Salary. Payrolls. | Remarks. |
|---|---|---|---|
| 1 Clerk | $150 00 | $1,800 00 | |
| 1 Clerk | 100 00 | 1,200 00 | |
| 1 Clerk | 87 50 | 825 00 | Increased from $600 to $1,050 per annum, July 1, 1908. |
| 1 Stenographer and Typewriter | 100 00 | 1,125 00 | Increased from $1,050 to $1,200 per annum, July 1, 1908. |
| 1 Stenographer and Typewriter | 87 50 | 975 00 | Increased from $900 to $1,050 per annum, July 1, 1908. |
| 1 General Inspector | 187 50 | 2,025 00 | Increased from $1,800 to $2,250 per annum, July 1, 1908. |
| 1 General Inspector | 150 00 | 1,800 00 | |
| 1 Inspector | 112 50 | 337 50 | Transferred to Queens, April 1, 1908. |
| 5 Inspectors, each | 112 50 | 6,750 00 | |
| 1 Inspector | 100 00 | 100 00 | Transferred to Chief Gas Examiner's Office, February 1, 1908. |
| 1 Inspector | 100 00 | 1,175 00 | Transferred from Manhattan Office, February 1, 1908. |
| 1 Inspector | 100 00 | 866 66 | Appointed, April 11, 1908. |
| 6 Inspectors, each | 112 50 | 7,650 00 | Increased from $1,200 to $1,350 per annum, July 1, 1908. |
| Total | | $26,629 16 | |

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## Edison Electric Illuminating Company, High Pressure Fire Service.

| Month. | Standby Charge. | Power Current. | Total. |
|---|---|---|---|
| January | $1,275 10 | $105 00 | $1,380 10 |
| February | 2,196 00 | 315 00 | 2,511 00 |
| March | 2,196 00 | 195 00 | 2,391 00 |
| April | 2,196 00 | 120 00 | 2,316 00 |
| May | 3,416 00 | 1,200 00 | 4,616 00 |
| June | 3,660 00 | 255 00 | 3,915 00 |
| July | 3,660 00 | 45 00 | 3,705 00 |
| August | 3,660 00 | 30 00 | 3,690 00 |
| September | 3,660 00 | 30 00 | 3,690 00 |
| October | 3,660 00 | ..... | 3,660 00 |
| November | 3,660 00 | 1,803 45 | 5,463 45 |
| December | 3,660 00 | 87 00 | 3,747 00 |
| | $36,899 10 | $4,185 45 | $41,084 55 |

## Summary of Expenditures, 1908.

| Companies. | Vouchers Chargeable to Appropriations, 1908. | | | |
|---|---|---|---|---|
| | Street Lamps. | Lighting Public Buildings. | Heat and Power. | Total. |
| Edison Electric Illuminating Company of Brooklyn | $443,020 33 | $89,948 42 | $13,535 07 | $546,503 82 |
| Flatbush Gas Company (electric) | 78,735 85 | 6,619 48 | 1,051 79 | 86,407 12 |
| Flatbush Gas Company (gas) | ..... | 5,833 48 | 203 58 | 6,037 06 |
| Welsbach Street Lighting Company of America, Limited | 18,721 01 | ..... | ..... | 18,721 01 |
| New York and New Jersey Globe Gas Lighting Company | 177,091 27 | ..... | ..... | 177,091 27 |
| Brooklyn Union Gas Company | 146,414 27 | 52,125 37 | 2,146 98 | 200,686 62 |
| Brooklyn Borough Gas Company | 3,888 54 | 1,472 13 | 234 66 | 5,595 33 |
| Kings County Lighting Company | 136,233 11 | 3,716 40 | 454 80 | 140,404 31 |
| Frank J. Gallagher | 180 46 | ..... | ..... | 180 46 |
| Gas Consumers' Association | ..... | 1,792 80 | ..... | 1,792 80 |
| Transit Development Company | ..... | 42 88 | ..... | 42 88 |
| Brooklyn Heights Railroad Company, account Department of Bridges | ..... | ..... | 50 44 | 50 44 |
| Total | $1,004,284 84 | $161,550 96 | $17,677 32 | $1,183,513 12 |

Note—Estimated outstanding liability, Edison Electric Illuminating Company of Brooklyn, $9,000, for street lamps.

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## Recapitulation, 1908 Appropriation Accounts.

| Appropriations. | | Funds Available. | Expenditures. | Balances. |
|---|---|---|---|---|
| **Heat, Light and Power, Bureau of Lamps and Lighting—** | | | | |
| Street and Park Lighting, 1908..... | $1,048,446 14 | | | |
| "Transfer From," Board of Estimate and Apportionment, June 25, 1909 | 16,500 00 | | | |
| | | $1,031,946 14 | | |
| Vouchers issued..... | $1,004,284 84 | | | |
| Estimated outstanding liabilities.... | 9,000 00 | | | |
| | | | $1,013,284 84 | $18,661 30 |
| Lighting Public Buildings, 1908..... | | 176,045 00 | | |
| Vouchers issued..... | | | 161,550 96 | 14,494 04 |
| Heat and Power for City Departments, etc., 1908..... | $10,840 00 | | | |
| "Transfer To," Board of Estimate and Apportionment, June 25, 1909... | 1,000 00 | | | |
| | | 17,840 00 | | |
| Vouchers issued..... | | | 17,677 32 | 162 68 |
| High Pressure Fire Service, Reservation of Machinery and Current, 1908..... | | 43,920 00 | | |
| Vouchers issued..... | | | 41,084 55 | 2,835 45 |
| Bureau Expenses, 1908..... | | 6,100 00 | | |
| Vouchers issued..... | | | 4,089 01 | 2,010 99 |
| Salaries and Wages, 1908..... | $24,700 00 | | | |
| "Transfer To," Board of Estimate and Apportionment, November 23, 1908 | 2,160 00 | | | |
| | | 26,860 00 | | |
| Vouchers issued..... | | | 26,629 16 | 230 84 |
| **Total**..... | | $1,302,711 14 | $1,264,315 84 | $38,395 30 |

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## BUREAU OF LAMPS AND LIGHTING.

### BOROUGH OF QUEENS.

Cost of Lighting Public Lamps in the Borough of Queens During the Year 1908—By Companies.

New York and Queens Electric Light and Power Company—Electric Arc Lighting.

| Month. | *Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 2,168 | $90 00 | $16,096 82 |
| February | 2,156 | 90 00 | 14,568 76 |
| March | 2,171 | 90 00 | 16,193 93 |
| April | 2,171 | 90 00 | 15,721 03 |
| May | 2,167 | 90 00 | 16,205 28 |
| June | 2,129 | 90 00 | 15,623 55 |
| July | 2,068 | 90 00 | 15,699 71 |
| August | 2,089 | 90 00 | 15,542 44 |
| September | 2,081 | 90 00 | 15,207 94 |
| Ocober | 2,065 | 90 00 | 15,533 19 |
| November | 2,059 | 90 00 | 14,952 69 |
| December | 2,052 | 90 00 | 15,365 95 |
| Total | | | $186,711 29 |

* 325-watt.

New York and Queens Electric Light and Power Company—Incandescent and 54-Watt Tungsten Lighting.

| Month. | *Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 254 | $25 00 | $488 30 |
| February | 280 | 25 00 | 511 21 |
| March | 280 | 25 00 | 554 79 |
| April | 280 | 25 00 | 544 42 |
| May | 280 | 25 00 | 554 17 |
| June | 362 | 25 00 | 596 02 |
| July | 400 | 25 00 | 778 55 |
| August | 489 | 25 00 | 912 83 |
| September | 590 | 25 00 | 1,075 61 |
| October | 686 | 25 00 | 1,291 46 |
| November | 924 | 25 00 | 1,628 38 |
| December | 1,280 | 25 00 | 2,326 02 |
| Total | | | $11,261 76 |

* 90 to 100-watt.

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New York and Queens Electric Light and Power Company—81-Watt Tungsten Lighting.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | .... | ..... | ..... |
| February | 25 | $33 00 | $50 26 |
| March | 25 | 33 00 | 70 06 |
| April | 25 | 33 00 | 67 80 |
| May | 25 | 33 00 | 70 06 |
| June | 68 | 33 00 | 120 98 |
| July | 180 | 33 00 | 357 17 |
| August | 198 | 33 00 | 525 95 |
| September | 242 | 33 00 | 566 36 |
| October | 352 | 33 00 | 807 54 |
| November | 374 | 33 00 | 1,005 07 |
| December | 429 | 33 00 | 1,113 54 |
| Total | | | $4,754 79 |

Queens Borough Gas and Electric Company—Electric Arc Lighting.

| Month. | *Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 238 | $90 00 | $1,787 79 |
| February | 238 | 90 00 | 1,593 98 |
| March | 238 | 90 00 | 1,798 02 |
| April | 238 | 90 00 | 1,733 92 |
| May | 238 | 90 00 | 1,795 69 |
| June | 250 | 90 00 | 1,770 41 |
| July | 261 | 90 00 | 1,933 00 |
| August | 261 | 90 00 | 1,984 81 |
| September | 261 | 90 00 | 1,918 47 |
| October | 270 | 90 00 | 1,984 06 |
| November | 269 | 90 00 | 1,990 35 |
| December | 268 | 90 00 | 2,019 45 |
| Total | | | $22,309 95 |

* 325-watt.

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Queens Borough Gas and Electric Company—Electric Incandescent Lighting.

| Month. | *Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January | 23 | $20 00 | $39 07 |
| February | 23 | 20 00 | 36 54 |
| March | 23 | 20 00 | 39 07 |
| April | 23 | 20 00 | 37 81 |
| May | 23 | 20 00 | 39 07 |
| June | 23 | 20 00 | 37 81 |
| July | 23 | 20 00 | 39 07 |
| August | 23 | 20 00 | 39 07 |
| September | 28 | 20 00 | 46 02 |
| October | 28 | 20 00 | 45 53 |
| November | 28 | 20 00 | 46 02 |
| December | 28 | 20 00 | 47 56 |
| Total | | | $492 64 |

* 78-watt.

All electric equipment supplied and maintained by company. All lamps burn 3,962 hours per annum (366 days).

Total cost of electric lighting, street lamps, 1908, $225,530.43.

New York and Queens Gas Company—Gas Lamps (Mantle).

| Month. | Number of Lamps. | Assumed Consumption Per Hour. | Price Per Lamp Per Annum. | Cost of Lighting (Gas Only). | Repairs. | Total. |
|---|---|---|---|---|---|---|
| January | *536 | 3½ cu. ft. | $10.40025 | $464 34 | ..... | $464 34 |
| February | 535 | 3½ cu. ft. | 10.40025 | 460 79 | $17 50 | 478 29 |
| March | 536 | 3½ cu. ft. | 10.40025 | 462 47 | 57 50 | 519 97 |
| April | 536 | 3½ cu. ft. | 10.40025 | 464 29 | ..... | 464 29 |
| May | 540 | 3½ cu. ft. | 10.40025 | 467 63 | ..... | 467 63 |
| June | 540 | 3½ cu. ft. | 10.40025 | 467 86 | 61 50 | 529 36 |
| July | 539 | 3½ cu. ft. | 10.40025 | 467 52 | 24 00 | 491 52 |
| August | 543 | 3½ cu. ft. | 10.40025 | 461 49 | 160 80 | 622 29 |
| September | 544 | 3½ cu. ft. | 10.40025 | 470 77 | 13 50 | 484 27 |
| October | 545 | 3½ cu. ft. | 10.40025 | 472 09 | ..... | 472 09 |
| November | 533 | 3½ cu. ft. | 10.40025 | 467 08 | ..... | 467 08 |
| December | 533 | 3½ cu. ft. | 10.40025 | 461 79 | 54 00 | 515 79 |
| Total | | | | $5,588 12 | $388 80 | $5,976 92 |

* 22-candle-power gas, 3,962 hours.

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Newtown Gas Company—Gas Lamps (Mantle).

| Month. | Number of Lamps. | Assumed Consumption Per Hour. | Price Per Lamp Per Annum. | Cost of Lighting (Gas Only). | Repairs. | Total. |
|---|---|---|---|---|---|---|
| January | 2,356 | 3½ cu. ft. | $10.40025 | $2,035 96 | $5 00 | $2,040 96 |
| February | 2,354 | 3½ cu. ft. | 10.40025 | 2,034 23 | 8 50 | 2,042 73 |
| March | 2,327 | 3½ cu. ft. | 10.40025 | 2,025 95 | 10 00 | 2,035 95 |
| April | 2,329 | 3½ cu. ft. | 10.40025 | 2,012 63 | 45 00 | 2,057 63 |
| May | 2,326 | 3½ cu. ft. | 10.40025 | 2,010 04 | 29 00 | 2,039 04 |
| June | 2,330 | 3½ cu. ft. | 10.40025 | 2,013 49 | 74 00 | 2,087 49 |
| July | 2,332 | 3½ cu. ft. | 10.40025 | 2,015 22 | 15 00 | 2,030 22 |
| August | 2,375 | 3½ cu. ft. | 10.40025 | 2,052 38 | 450 00 | 2,502 38 |
| September | 2,374 | 3½ cu. ft. | 10.40025 | 2,051 52 | 861 40 | 2,912 92 |
| October | 2,423 | 3½ cu. ft. | 10.40025 | 2,093 96 | 167 00 | 2,260 96 |
| November | 2,422 | 3½ cu. ft. | 10.40025 | 2,093 09 | 671 50 | 2,764 59 |
| December | 2,488 | 3½ cu. ft. | 10.40025 | 2,150 12 | 244 00 | 2,394 12 |
| Total | | | | $24,588 59 | $2,580 40 | $27,168 99 |

Posts supplied by the City; lamps by the New York and New Jersey Globe Gas Light Company.

Richmond Hill and Queens Company Gas Light Company—Gas Lamps (Mantle).

| Month. | Number of Lamps. | Assumed Consumption Per Hour. | Price Per Lamp Per Annum. | Cost of Lighting (Gas Only). | Repairs. | Total. |
|---|---|---|---|---|---|---|
| January | 467 | 3½ cu. ft. | $10.40025 | $403 56 | ..... | $403 56 |
| February | 466 | 3½ cu. ft. | 10.40025 | 402 70 | ..... | 402 70 |
| March | 466 | 3½ cu. ft. | 10.40025 | 402 70 | ..... | 402 70 |
| April | 466 | 3½ cu. ft. | 10.40025 | 402 70 | $135 00 | 537 70 |
| May | 466 | 3½ cu. ft. | 10.40025 | 402 70 | ..... | 402 70 |
| June | 466 | 3½ cu. ft. | 10.40025 | 402 70 | ..... | 402 70 |
| July | 494 | 3½ cu. ft. | 10.40025 | 426 89 | 280 00 | 706 89 |
| August | 489 | 3½ cu. ft. | 10.40025 | 422 57 | ..... | 422 57 |
| September | 500 | 3½ cu. ft. | 10.40025 | 432 08 | 223 80 | 655 88 |
| October | 500 | 3½ cu. ft. | 10.40025 | 432 10 | 4 00 | 436 10 |
| November | 510 | 3½ cu. ft. | 10.40025 | 440 74 | 113 50 | 554 24 |
| December | 511 | 3½ cu. ft. | 10.40025 | 441 60 | 27 50 | 469 10 |
| Total | | | | $5,013 04 | $783 80 | $5,796 84 |

Posts supplied by the City; lamps by the New York and New Jersey Globe Gas Light Company.

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Woodhaven Gas Light Company—Gas Lamps (Mantle).

| Month. | Number of Lamps. | Assumed Consumption Per Hour. | Price Per Lamp Per Annum. | Cost of Lighting (Gas Only). | Repairs. | Total. |
|---|---|---|---|---|---|---|
| January | 471 | 3½ cu. ft. | $10.40025 | $407 02 | ..... | $407 02 |
| February | 470 | 3½ cu. ft. | 10.40025 | 406 15 | $270 00 | 676 15 |
| March | 471 | 3½ cu. ft. | 10.40025 | 407 02 | ..... | 407 02 |
| April | 471 | 3½ cu. ft. | 10.40025 | 407 02 | 4 00 | 411 02 |
| May | 471 | 3½ cu. ft. | 10.40025 | 407 02 | ..... | 407 02 |
| June | 471 | 3½ cu. ft. | 10.40025 | 407 02 | ..... | 407 02 |
| July | 489 | 3½ cu. ft. | 10.40025 | 422 57 | 180 00 | 602 57 |
| August | 500 | 3½ cu. ft. | 10.40025 | 432 08 | 123 50 | 555 58 |
| September | 500 | 3½ cu. ft. | 10.40025 | 432 08 | 97 80 | 529 88 |
| October | 500 | 3½ cu. ft. | 10.40025 | 432 10 | ..... | 432 10 |
| November | 523 | 3½ cu. ft. | 10.40025 | 451 98 | 230 00 | 681 98 |
| December | 532 | 3½ cu. ft. | 10.40025 | 459 75 | 90 00 | 549 75 |
| Total | | | | $5,071 81 | $995 30 | $6,067 11 |

Posts supplied by the City; lamps by the New York and New Jersey Globe Gas Light Company.

Jamaica Gas Light Company—Gas Lamps (Mantle).

| Month. | Number of Lamps. | Assumed Consumption Per Hour. | Price Per Lamp Per Annum. | Cost of Lighting (Gas Only). | Repairs. | Total. |
|---|---|---|---|---|---|---|
| January | 151 | 3½ cu. ft. | $10.40025 | $130 49 | ..... | $130 49 |
| February | 151 | 3½ cu. ft. | 10.40025 | 130 49 | ..... | 130 49 |
| March | 161 | 3½ cu. ft. | 10.40025 | 138 42 | $110 00 | 248 42 |
| April | 162 | 3½ cu. ft. | 10.40025 | 139 99 | 27 00 | 166 99 |
| May | 189 | 3½ cu. ft. | 10.40025 | 163 33 | 271 50 | 434 83 |
| June | 193 | 3½ cu. ft. | 10.40025 | 166 78 | 53 50 | 220 28 |
| July | 195 | 3½ cu. ft. | 10.40025 | 168 51 | 20 00 | 188 51 |
| August | 205 | 3½ cu. ft. | 10.40025 | 177 15 | 190 00 | 367 15 |
| September | 216 | 3½ cu. ft. | 10.40025 | 186 66 | 149 00 | 335 66 |
| October | 216 | 3½ cu. ft. | 10.40025 | 186 67 | ..... | 186 67 |
| November | 224 | 3½ cu. ft. | 10.40025 | 193 58 | 80 00 | 273 58 |
| December | 222 | 3½ cu. ft. | 10.40025 | 191 85 | 31 50 | 223 35 |
| Total | | | | $1,973 92 | $932 50 | $2,906 42 |

Posts supplied by the City; lamps by the New York and New Jersey Globe Gas Light Company.

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Queens Borough Gas and Electric Company—Gas Lamps (Mantle).

| Month. | Number of Lamps. | Assumed Consumption Per Hour. | Price Per Lamp Per Annum. | Cost of Lighting (Gas Only). | Repairs. | Total. |
|---|---|---|---|---|---|---|
| January | 245 | 3½ cu. ft. | $10.40025 | $211 72 | ..... | $211 72 |
| February | 244 | 3½ cu. ft. | 10.40025 | 210 85 | ..... | 210 85 |
| March | 244 | 3½ cu. ft. | 10.40025 | 210 85 | $154 00 | 364 85 |
| April | 244 | 3½ cu. ft. | 10.40025 | 210 85 | ..... | 210 85 |
| May | 297 | 3½ cu. ft. | 10.40025 | 256 65 | ..... | 256 65 |
| June | 315 | 3½ cu. ft. | 10.40025 | 272 19 | ..... | 272 19 |
| July | 315 | 3½ cu. ft. | 10.40025 | 272 21 | ..... | 272 21 |
| August | 315 | 3½ cu. ft. | 10.40025 | 272 21 | ..... | 272 21 |
| September | 317 | 3½ cu. ft. | 10.40025 | 273 94 | 25 00 | 298 94 |
| October | 317 | 3½ cu. ft. | 10.40025 | 273 95 | ..... | 273 95 |
| November | 317 | 3½ cu. ft. | 10.40025 | 273 95 | ..... | 273 95 |
| December | 317 | 3½ cu. ft. | 10.40025 | 273 95 | ..... | 273 95 |
| Total | | | | $3,013 32 | $179 00 | $3,192 32 |

Posts supplied by the City; lamps by the New York and New Jersey Globe Gas Light Company.

New York and New Jersey Globe Gas Light Company, Ltd.—Gas Lamps (Mantle), Maintenance.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. | Painting Lamp-posts. | Total. |
|---|---|---|---|---|---|
| January | 4,226 | $13 98 | $4,918 88 | ..... | $4,918 88 |
| February | 4,220 | 13 98 | 4,904 17 | ..... | 4,904 17 |
| March | 4,205 | 13 98 | 4,891 01 | ..... | 4,891 01 |
| April | 4,208 | 13 98 | 4,910 67 | ..... | 4,910 67 |
| May | 4,289 | 13 98 | 4,939 64 | ..... | 4,939 64 |
| June | 4,315 | 13 98 | 5,009 76 | ..... | 5,009 76 |
| July | 4,364 | 13 98 | 5,046 30 | ..... | 5,046 30 |
| August | 4,427 | 13 98 | 5,014 35 | $63 00 | 5,077 35 |
| September | 4,451 | 13 98 | 5,181 59 | ..... | 5,181 59 |
| October | 4,501 | 13 98 | 5,241 20 | ..... | 5,241 20 |
| November | 4,529 | 13 98 | 5,275 88 | ..... | 5,275 88 |
| December | 4,603 | 13 98 | 5,332 21 | ..... | 5,332 21 |
| Total | | | $60,665 66 | $63 00 | $60,728 66 |

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Cost of Lighting Public Lamps in the Borough of Queens During the Year 1908—By Companies.

Harry Kramer, painting lamp-posts..... *$261 00

* Identification stripe on posts in the Third and Fourth Wards.

Welsbach Street Lighting Company of America—Naphtha Lamps (Mantle).

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| January..... | 690 | $28 20 | $1,617 86 |
| February..... | 690 | 28 20 | 1,617 53 |
| March..... | 672 | 28 20 | 1,602 63 |
| April..... | 668 | 28 20 | 1,567 45 |
| May..... | 667 | 28 20 | 1,565 55 |
| June..... | 666 | 28 20 | 1,565 72 |
| July..... | 635 | 28 20 | 1,551 84 |
| August..... | 517 | 28 20 | 1,167 80 |
| September..... | 411 | 28 20 | 984 58 |
| October..... | 330 | 28 20 | 867 22 |
| November..... | 210 | 28 20 | 621 17 |
| December..... | 18 | 28 20 | 260 02 |
| Total..... | | | $14,989 37 |

All equipment and maintenance supplied by the company.

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Statement Showing the Estimated Cost of Street Light

| Companies. | Electricity. | | |
|---|---|---|---|
| | Arc. | Incandescent. | Total. |
| New York and Queens Electric Light and Power Company | $186,711 29 | $16,016 55 | $202,727 84 |
| Queens Borough Gas and Electric Company | 22,309 85 | 492 64 | 22,802 59 |
| New York and Queens Gas Company | ..... | ..... | ..... |
| Newtown Gas Company | ..... | ..... | ..... |
| Richmond Hill and Queens County Gas Light | ..... | ..... | ..... |
| Woodhaven Gas Light Company | ..... | ..... | ..... |
| Jamaica Gas Light Company | ..... | ..... | ..... |
| Queens Borough Gas and Electric Company | ..... | ..... | ..... |
| New York and New Jersey Globe Gas Light Company | ..... | ..... | ..... |
| Harry Kramer | ..... | ..... | ..... |
| Welsbach Street Lighting Company of America | ..... | ..... | ..... |
| Total | $209,021 24 | $16,509 19 | $225,530 43 |

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ing in the Borough of Queens During the Year 1908.

| Gas (Mantle). | | | | Naphtha (Mantle). | Grand Total |
|---|---|---|---|---|---|
| Maintenance. | Gas, Estimated. | Repairs. | Total. | | |
| ..... | ..... | ..... | ..... | ..... | $202,727 84 |
| ..... | ..... | ..... | ..... | ..... | 22,802 59 |
| ..... | $5,588 12 | $388 80 | $5,976 92 | ..... | 5,976 92 |
| ..... | 24,588 59 | 2,580 40 | 27,168 99 | ..... | 27,168 99 |
| ..... | 5,013 04 | 783 80 | 5,796 84 | ..... | 5,796 84 |
| ..... | 5,071 81 | 995 30 | 6,067 11 | ..... | 6,067 11 |
| ..... | 1,973 92 | 932 50 | 2,906 42 | ..... | 2,906 42 |
| ..... | 3,013 32 | 179 00 | 3,192 32 | ..... | 3,192 32 |
| $60,665 66 | ..... | 63 00 | 60,728 66 | ..... | 60,728 66 |
| ..... | ..... | 261 00 | 261 00 | ..... | 261 00 |
| ..... | ..... | ..... | ..... | $14,989 37 | 14,989 37 |
| $60,665 66 | $45,248 80 | $6,183 80 | $112,098 26 | $14,989 37 | $352,618 06 |

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Cost of Electric Lighting, Public Buildings, in the Borough of Queens, During the Year 1908—By Companies and Departments.

| Departments. | New York and Queens Electric Light and Power Company. | Queens Borough Gas and Electric Company. | Total, Departments. | Consumption, Kilowatt Hours. |
|---|---|---|---|---|
| Administration Buildings | $7,466 90 | $286 10 | $7,753 00 | 77,530.0 |
| Armories | 1,134 50 | ..... | 1,134 50 | 11,345.0 |
| Education | 3,623 48 | 82 20 | 3,705 68 | 37,056.8 |
| Fire | ..... | 1,047 15 | 1,047 15 | 10,471.5 |
| Health | 55 70 | ..... | 55 70 | 557.0 |
| Police | 2,175 10 | 526 10 | 2,701 20 | 27,012.0 |
| Total | $14,455 68 | $1,941 55 | $16,397 23 | 163,972.3 |

Rate, 10 cents per kilowatt hour.

Cost of Gas Lighting in Public Buildings in the Borough of

| Departments. | Queens Borough Gas and Electric Company. | New York and Queens Gas Company. | Newtown Gas Company. |
|---|---|---|---|
| Administration Buildings | $14 04 | $87 69 | $90 83 |
| Armories | ..... | 15 10 | ..... |
| Education | 117 23 | 246 16 | 1,632 16 |
| Fire | 1,317 45 | 78 10 | ..... |
| Health | ..... | ..... | ..... |
| Police | 265 36 | 466 12 | 496 20 |
| Total | $1,714 08 | $893 17 | $2,219 19 |

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Queens During the Year 1908, by Companies and Departments.

| Richmond Hill and Queens County Gas Light Company. | Woodhaven Gas Light Company. | Jamaica Gas Light Company. | East River Gas Company. | Total, Departments. | Consumption, Cubic Feet. |
|---|---|---|---|---|---|
| ..... | ..... | $140 72 | $1,800 69 | $2,133 97 | 2,845.300 |
| ..... | ..... | ..... | ..... | 15 10 | 20.100 |
| $136 31 | $252 13 | 374 83 | 1,073 17 | 3,831 99 | 5,109.300 |
| 130 89 | ..... | 727 33 | 1,003 80 | 3,257 57 | 4,343.400 |
| ..... | ..... | 90 | ..... | 90 | 1.200 |
| 251 72 | 132 09 | 863 64 | 484 74 | 2,959 87 | 3,946.500 |
| $518 92 | $384 22 | $2,107 42 | $4,362 40 | $12,199 40 | 16,265.800 |

Rate, 75 cents per 1,000 cubic feet.

Gas Consumers' Association, rental of gas regulators..... $361 58

Summary.

| | |
|---|---|
| Electric | $16,397 23 |
| Gas | 12,199 40 |
| Rental gas regulators | 361 58 |
| Total | $28,958 21 |

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Cost of Heat and Power to Public Buildings in the Borough of Queens During the Year 1908, by Companies and Departments.

| Departments. | New York and Queens Electric Light and Power Company. | East River Gas Company. | Total. | Consumption. | |
|---|---|---|---|---|---|
| | | | | Kilowatt Hours. | Cubic Feet. |
| Education | $1,409 36 | $417 23 | $1,826 59 | 17,617.0 | 556.300 |
| Parks | 5 92 | ..... | 5 92 | 74.0 | ..... |
| Fire | 250 32 | ..... | 250 32 | 3,129.0 | ..... |
| Total | $1,665 60 | $417 23 | $2,082 83 | 20,820.0 | 556.300 |

Rate, 8 cents per kilowatt hour; rate, 75 cents per 1,000 cubic feet.

Bureau Expenses in the Borough of Queens During the Year 1908.

| For | | Amounts. |
|---|---|---|
| Automobile hire | | $1,547 00 |
| Horse and wagon hire | | 2,287 00 |
| Inspectors' disbursements | | 304 32 |
| Photometric Stations— | | |
| Rents | $605 00 | |
| Telephones | 83 85 | |
| | | 688 85 |
| Telephone (Borough office) | | 132 15 |
| Total | | $4,959 32 |

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Salaries of Office Employees and Inspectors in the Borough of Queens During the Year 1908.

| Position. | Salary. Monthly. | Salary. Payrolls. | Remarks. |
|---|---|---|---|
| 1 Assistant Engineer.... | $187 50 | $2,250 00 | |
| 1 Clerk ..... | 166 66 | 1,499 94 | Transferred to Water Department payroll October 1, 1908. |
| 1 Clerk ..... | 87 50 | 900 00 | Increased from $750 to $1,050 per annum July 1, 1908. |
| 1 General Inspector..... | 137 50 | 1,650 00 | |
| 1 Inspector ..... | 112 50 | 1,350 00 | |
| 1 Inspector ..... | 112 50 | 1,275 00 | Increased from $1,200 to $1,350 per annum July 1, 1908. |
| 1 Inspector ..... | 100 00 | 182 76 | Resigned February 25, 1908. |
| 1 Inspector ..... | 112 50 | 1,012 50 | Transferred from Brooklyn April I, 1908. |
| 1 Inspector ..... | 125 00 | 1,125 00 | Transferred from Manhattan April 1, 1908. |
| Total..... | | $11,245 20 | |

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Summary of Expenditures and Esti

| | |
|---|---|
| New York and Queens Electric Light and Power Company | |
| Queens Borough Gas and Electric Company (electric) | |
| Queens Borough Gas and Electric Company (gas) | |
| New York and Queens Gas Company | |
| Newtown Gas Company | |
| Richmond Hill and Queens County Gas Light Company | |
| Woodhaven Gas Light Company | |
| Jamaica Gas Light Company | |
| New York and New Jersey Globe Gas Light Company (Mtc.) | |
| Harry Kramer | |
| Welsbach Street Lighting Company of America | |
| East River Gas Company | |
| Gas Consumers' Association | |
| Total | |

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mated Liabilities Outstanding, 1908.

| Vouchers Chargeable to Appropriations, 1908. | | | | Estimated Outstanding Liabilities, 1908. | | | |
|---|---|---|---|---|---|---|---|
| Street Lamps. | Lighting Public Buildings. | Heat and Power. | Total. | Street Lamps. | Lighting Public Buildings. | Heat and Power. | Total. |
| $202,727 84 | $14,455 68 | $1,665 60 | $218,849 12 | ..... | ..... | ..... | ..... |
| 22,802 59 | 1,941 55 | ..... | 24,744 14 | ..... | ..... | ..... | ..... |
| 179 00 | ..... | ..... | 179 00 | $3,013 32 | $1,714 08 | ..... | $4,727 40 |
| 5,976 92 | 893 17 | ..... | 6,870 09 | ..... | ..... | ..... | ..... |
| 2,580 40 | ..... | ..... | 2,580 40 | 24,588 59 | 2,219 19 | ..... | 26,807 78 |
| 783 80 | ..... | ..... | 783 80 | 5,013 04 | 518 92 | ..... | 5,531 96 |
| 995 30 | ..... | ..... | 995 30 | 5,071 81 | 384 22 | ..... | 5,456 03 |
| 932 50 | ..... | ..... | 932 50 | 1,973 92 | 2,107 42 | ..... | 4,081 34 |
| 60,728 66 | ..... | ..... | 60,728 66 | ..... | ..... | ..... | ..... |
| 261 00 | ..... | ..... | 261 00 | ..... | ..... | ..... | ..... |
| 14,989 37 | ..... | ..... | 14,989 37 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | 4,362 40 | $417 23 | 4,779 63 |
| ..... | 361 58 | ..... | 361 58 | ..... | ..... | ..... | ..... |
| $312,957 38 | $17,651 98 | $1,665 60 | $332,274 96 | $39,660 68 | $11,306 23 | $417 23 | $51,384 14 |

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## BUREAU OF LAMPS AND LIGHTING.

### BOROUGH OF RICHMOND.

### SCHEDULE I.

Richmond Light and Railroad Company—Electric Arc Lamps, 450-watt.

| Month. | *Number of Lamps. | Price Per Lamp Per Annum. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 664 | $100 00 | $47 54 | $5,592 48 |
| February | 664 | 100 00 | 42 85 | 5.051 35 |
| March | 680 | 100 00 | 25 07 | 5,737 42 |
| April | 680 | 100 00 | 21 64 | 5,567 96 |
| May | 680 | 100 00 | 21 78 | 5,754 14 |
| June | 694 | 100 00 | 4 93 | 5,646 05 |
| July | 695 | 100 00 | 9 31 | 5,894 02 |
| August | 695 | 100 00 | 14 66 | 5,888 67 |
| September | 695 | 100 00 | 4 79 | 5,708 11 |
| October | 695 | 100 00 | 15 76 | 5,887 57 |
| November | 699 | 100 00 | 26 58 | 5,689 61 |
| December | 699 | 100 00 | 21 38 | 5,915 93 |
| Total | | | $256 29 | $68,333 31 |

* Alternating current lamps.

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## SCHEDULE I.-A.

Richmond Light and Railroad Company—Electric Incandescent Lamps, 90 and 100-watt.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Outages. | Cost of Lighting. |
|---|---|---|---|---|
| January | 3,933 | $25 00 | $85 78 | $8,264 73 |
| February | 3,933 | 25 00 | 42 78 | 7,768 98 |
| March | 3,933 | 25 00 | 12 16 | 8,338 35 |
| April | 3,933 | 25 00 | 25 89 | 8,055 25 |
| May | 3,933 | 25 00 | 12 53 | 8,337 98 |
| June | 3,933 | 25 00 | 9 56 | 8,071 58 |
| July | 3,933 | 25 00 | 9 66 | 8,340 85 |
| August | 3,933 | 25 00 | 13 77 | 8,336 74 |
| September | 3,933 | 25 00 | 10 99 | 8,070 15 |
| October | 3,933 | 25 00 | 24 56 | 8,325 95 |
| November | 3,933 | 25 00 | 62 02 | 8,019 12 |
| December | 3,744 | 25 00 | 19 94 | 8,125 58 |
| Total | | | $329 64 | $98,055 26 |

Estimated settlement for poor service still under negotiation.

## SCHEDULE I.-B.

Welsbach Street Lighting Company of America—Mantle Gas Lamps, Maintenance.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. |
|---|---|---|---|
| November | *234 | $13 98 | $99 96 |
| December | 235 | 13 98 | 272 95 |
| Total | | | $372 91 |

* Began lighting November 20, 1908.

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## SCHEDULE I.-C.

New York and Richmond Gas Company—Mantle Gas Lamps.

| Month. | Number of Lamps. | Price Per Lamp Per Annum. | Cost of Lighting. | Removing Lamp-posts. | Erection of Lamp-posts. | Total. |
|---|---|---|---|---|---|---|
| September | .... | ..... | ..... | $895 00 | ..... | $895 00 |
| October | .... | ..... | ..... | ..... | ..... | ..... |
| November | *234 | $10.40025 | $73 07 | ..... | ..... | 73 07 |
| December | 235 | 10.40025 | 206 32 | ..... | $2,937 50 | 3,143 82 |
| Total | | | $279 39 | $895 00 | $2,937 50 | $4,111 89 |

* Began lighting November 20, 1908.

## SCHEDULE I.-D.

Cost of Lighting Public Lamps in the Borough of Richmond During the Year 1908—By Companies.

| | |
|---|---|
| Frank W. Trimble, crossheads | *$166 10 |

### Summary.

| | |
|---|---|
| Electric Arc Lighting | $68,333 31 |
| †Electric incandescent lighting | 98,055 26 |
| Gas maintenance | 372 91 |
| Gas | 279 39 |
| Removing lamp-posts | 895 00 |
| Erection of lamp-posts | 2,937 50 |
| Crossheads | 166 10 |
| Total | $171,039 47 |

* Furnishing crossheads for mantle gas lamps.
† Estimated.

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Cost of Lighting Public Buildings in the Borough of Richmond During the Year 1908—By Companies.

| Departments. | *(A) Richmond Light and Railroad Company. | †(B) New York and Richmond Gas Company. | Total. | Consumption. (A) Kilowatt Hours. | Consumption. (B) Cubic Feet. |
|---|---|---|---|---|---|
| Public buildings | $10,614 36 | ..... | $10,614 36 | 106,143.6 | ..... |
| Education | 4,023 27 | $404 99 | 4,428 26 | 40,232.7 | 540.000 |
| Fire | 813 35 | 1,221 09 | 2,034 44 | 8,133.5 | 1,628.100 |
| Police | 556 47 | 585 27 | 1,141 74 | 5,564.7 | 780.400 |
| Street Cleaning | 553 93 | ..... | 553 93 | 5,539.3 | ..... |
| Farm Colony | 1,674 61 | ..... | 1,674 61 | 16,746.1 | ..... |
| Water Supply, Gas and Electricity. | ..... | 14 06 | 14 06 | ..... | 18.700 |
| Total | $18,235 99 | $2,225 41 | $20,461 40 | 182,359.9 | 2,967.200 |

*10 cents per kilowatt hour.
†75 cents per 1,000 cubic feet.

Summary.

| | |
|---|---|
| *Electric | $18,235 99 |
| Gas | 2,225 41 |
| Rental of gas regulators | 56 88 |
| Total | $20,518 28 |

*Estimated.

Cost of Power to Public Buildings in the Borough of Richmond During the Year 1908—By Companies.

| Departments. | *(A) Richmond Light and Railroad Company. | †(B) New York and Richmond Gas Company. | Total. | Consumption. (A) Horse Power Hours. | Consumption. (B) Cubic Feet. |
|---|---|---|---|---|---|
| Borough Hall | $211 20 | ..... | $211 20 | 4,224.0 | ..... |
| Richmond County Court House | 286 03 | ..... | 286 03 | 5,720.6 | ..... |
| Richmond County Jail | 94 98 | ..... | 94 98 | 1,899.6 | ..... |
| Education | ..... | $268 62 | 268 62 | ..... | 358.200 |
| Total | $592 21 | $268 62 | $860 83 | 11,844.2 | 358.200 |

*5 cents per horse-power hour.
†75 cents per 1,000 cubic feet.

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Summary.

| | |
|---|---|
| Electric | $592 21 |
| Gas | 268 62 |
| Rental of gas regulators | 6 32 |
| Total | $867 15 |

Bureau Expenses in the Borough of Richmond During the Year 1908.

| | |
|---|---|
| Automobile as conveyance | $999 96 |
| Trolley tickets | 125 00 |
| Furniture and fixtures | 47 50 |
| Toilet supplies | 13 75 |
| Rental of gas regulators | 12 64 |
| Rent of photometric stations | 400 00 |
| Miscellaneous | 376 13 |
| Total | $1,974 98 |

Salaries of Office Employees and Inspectors in the Borough of Richmond During the Year 1908.

| Position. | Salary. Monthly. | Annual. |
|---|---|---|
| 1 Clerk | $125 00 | $1,500 00 |
| 1 Chief Inspector of Electrical Conductors | 150 00 | 1,800 00 |
| 1 Inspector of Exterior Wiring | 100 00 | *1,099 98 |
| 2 Inspectors of Lamps and Gas | 112 50 | †2,550 00 |
| 1 Stenographer and Typewriter | 87 50 | 1,050 00 |
| Total | | $7,999 98 |

*Increased from $1,000 to $1,200 per annum July 1, 1908.
†Increased from $1,200 to $1,350 per annum July 1, 1908.

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Statement Showing Expenditures and

| Companies. | Expenditures. | |
|---|---|---|
| | Streets. | Public Buildings. |
| Richmond Light and Railroad Company | $148,333 31 | $13,000 00 |
| Welsbach Street Lighting Company of America (maintenance) | 372 91 | ..... |
| New York and Richmond Gas Company | 4,111 89 | 2,225 41 |
| Frank W. Trimble | 166 10 | ..... |
| Gas Consumers' Association | ..... | 56 88 |
| Total | $152,984 21 | $15,282 29 |

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Estimated Outstanding Liabilities, 1908.

| Expenditures. | | Estimated Outstanding Liabilities. | | | |
|---|---|---|---|---|---|
| Heat and Power. | Total. | Streets. | Public Buildings. | Heat and Power. | Total. |
| $592 21 | $161,925 52 | $18,055 26 | $5,235 99 | ..... | $23,291 25 |
| ..... | 372 91 | ..... | ..... | ..... | ..... |
| 268 62 | 6,605 92 | ..... | ..... | ..... | ..... |
| ..... | 166 10 | ..... | ..... | ..... | ..... |
| 6 32 | 63 20 | ..... | ..... | ..... | ..... |
| $867 15 | $169,133 65 | $18,055 26 | $5,235 99 | ..... | $23,291 25 |

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Recapitulation, 1908, Appropriation Accounts.

| Appropriations. | | Funds Available. | Expenditures. | Balances. | Deficits. |
|---|---|---|---|---|---|
| Heat, Light and Power, Bureau of Lamps and Lighting— | | | | | |
| Street and Park Lighting, 1908..... | | $173,375 00 | | | |
| Vouchers issued ..... | $152,984 21 | | | | |
| Outstanding estimated liabilities ..... | 18,055 26 | | | | |
| | | | $171,039 47 | $2,335 53 | |
| Lighting Public Buildings, 1908..... | | 15,840 00 | | | |
| Vouchers issued ..... | $15,282 29 | | | | |
| Outstanding estimated liabilities ..... | 5,235 99 | | | | |
| | | | 20,518 28 | | $4,678 28 |
| Heat and Power for City Departments, etc., 1908 ..... | | 1,385 00 | | | |
| Vouchers issued ..... | | | 867 15 | 517 85 | |
| Bureau Expenses, 1908..... | | 2,050 00 | | | |
| Vouchers issued ..... | | | 1,974 98 | 75 02 | |
| Salaries and Wages, 1908.... | $9,400 00 | | | | |
| Transfer from Board of Estimate and Apportionment November 23, 1908. | 660 00 | | | | |
| | | 8,740 00 | | | |
| Vouchers issued ..... | | | 7,999 98 | 740 02 | |
| Total..... | | $201,390 00 | $202,399 86 | $3,668 42 | $4,678 28 |

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## REPORT OF DIVISION OF STREET LIGHTING.

December 31, 1908.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I submit herewith a report covering street lighting in The City of New York for the year 1908, and special tables on the number of lamps in use in each of the five Boroughs since 1901, and of repairs to gas lamp-posts from 1903 to 1908.

The average number of lamps on street service increased during the year from 65,873 to 67,826 Aside from the large number of lamps relocated in order to improve the lighting conditions, there were 4,478 new lamps lighted, 3,880 lamps relighted and 6,497 lamps discontinued, a total of 14,855 lighting changes during the year, as shown on Tables A to G.

In addition to the above the following lamps were in use December 31, 1908:

Free lamps on street service, 192; bridge lamps on meter service, 272; bridge lamps on isolated plant service, 70; bridge lamps supplied by private parties, 117; street lamps supplied by private parties, 600, making a total of 70,425 lamps in use on streets, bridges, viaducts and in public parks.

### Erection and Repairs to Posts.

There were 1,415 gas and 319 electric lamp-posts erected, and 6,017 gas lamp-posts repaired, all of which are the property of the City.

On Riverside drive extension there were 54 fixtures for 76 electric lamps installed by the President of the Borough of Manhattan and lighted by this Department. The City owns a few ornamental electric posts in parks, at monuments and on bridges in addition to the above, but this is the first installation of any size of electric posts made by the City since the installation of 8 arc and 42 incandescent lamps on City posts in St. John's Park in 1898.

### Improvements in Street Lighting.

The principal improvements in the lighting conditions were made in the Boroughs of Manhattan, Queens and Richmond, and the work completed in the first-named Borough is of more importance than anything accomplished since the changing of the open flame gas lamps to the mantle type in 1904 and 1906.

Two important thoroughfares, aggregating five miles in length, Seventh avenue and Broadway, were lighted by means of arc lamps with a new style of equipment.

One parkway, Riverside drive and Riverside drive extension, from Seventy-second to One Hundred and Forty-fifth street, a distance of over three and one-half miles, was changed over to electric arc and incandescent lighting, and three parks, Riverside, St. Nicholas and High Bridge, were lighted by electric incandescent lamps, all being supplied by underground conductors.

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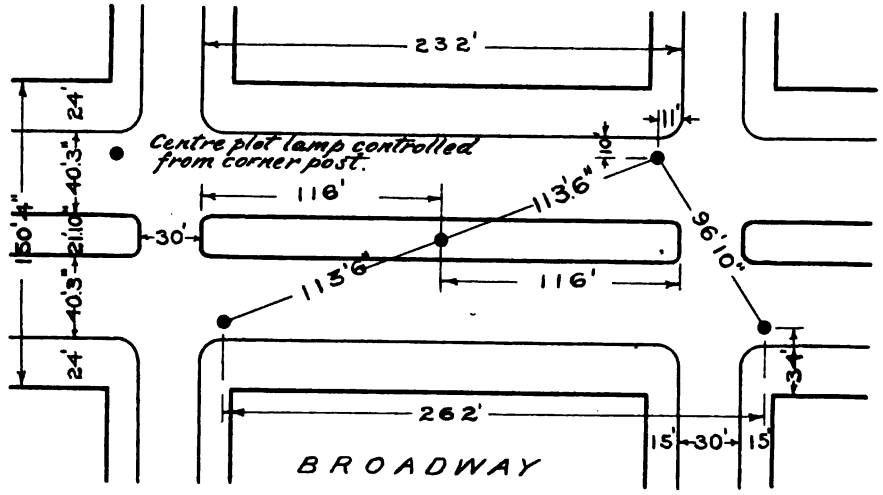
-FIG. 1.-



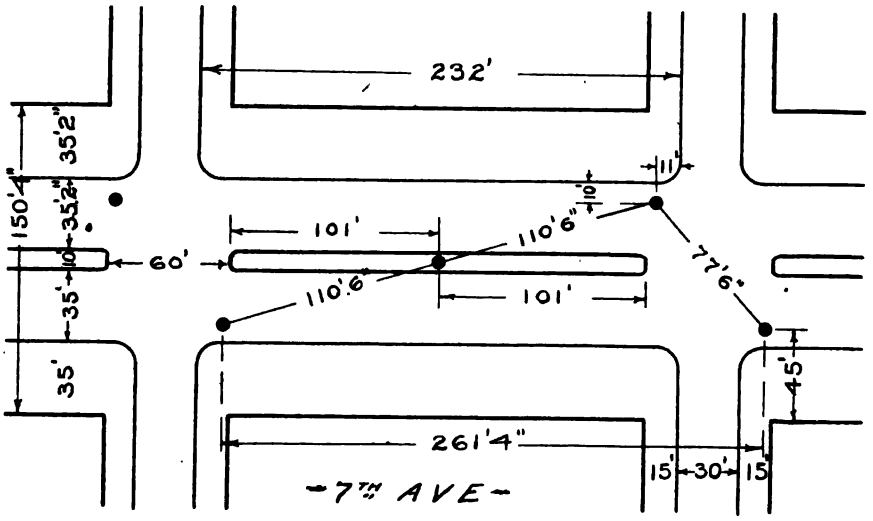




FIG. 2.

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Seventh Avenue —The principal thoroughfare north of Central Park is Seventh avenue, which extends from One Hundred and Tenth street to the Harlem River at One Hundred and Fifty-fifth street, a distance of over two miles. The avenue is 150 feet wide and each sidewalk has a width of 35 feet and is lined with immense elms. During 1907 contracts were let for paving this street with asphalt, which provided for centre plots 10 feet in width with a 35-foot roadway on each side. Three lamps were installed upon each block, as shown in Figure 2, this system giving each block the benefit of the light from five lamps.

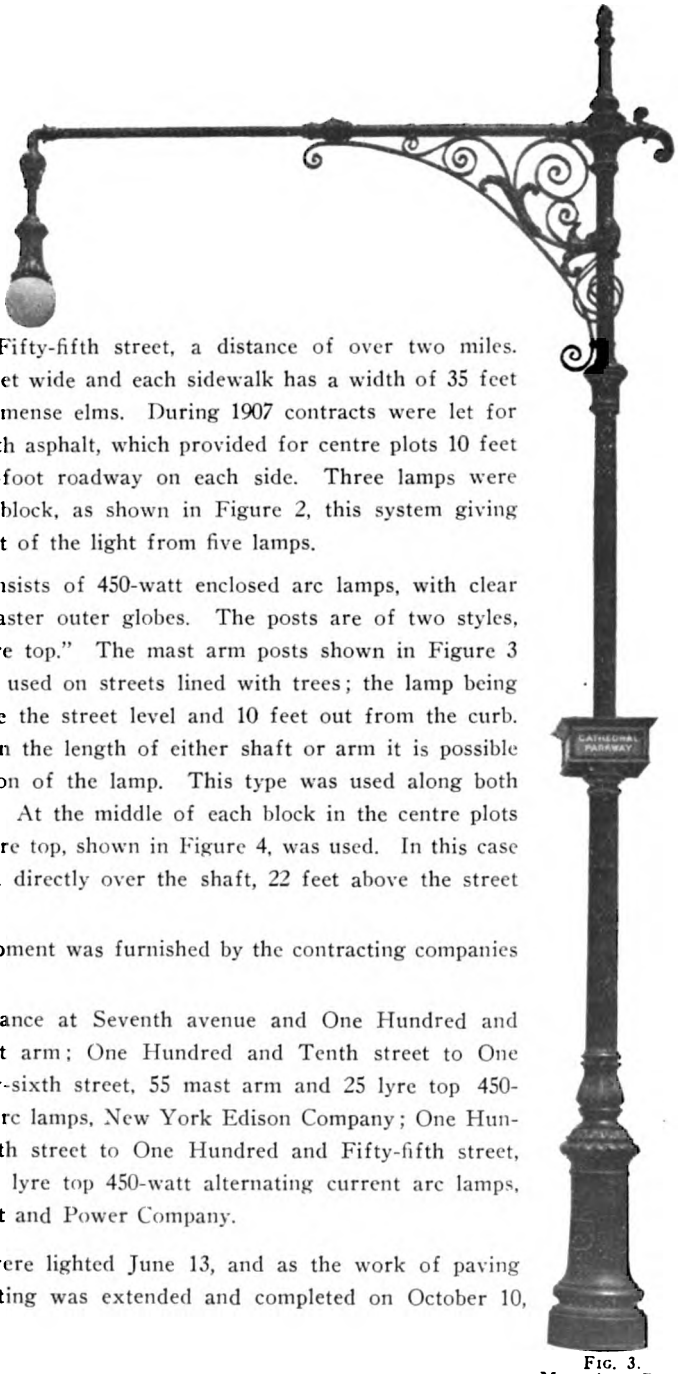


FIG. 3.
Mast Arm Post.

The equipment consists of 450-watt enclosed arc lamps, with clear inner and light alabaster outer globes. The posts are of two styles, "mast arm" and "lyre top." The mast arm posts shown in Figure 3 were designed to be used on streets lined with trees; the lamp being located 22 feet above the street level and 10 feet out from the curb. By a slight change in the length of either shaft or arm it is possible to change the position of the lamp. This type was used along both sides of the avenue. At the middle of each block in the centre plots the type known as lyre top, shown in Figure 4, was used. In this case the lamps are placed directly over the shaft, 22 feet above the street level.

The complete equipment was furnished by the contracting companies as follows:

Central Park entrance at Seventh avenue and One Hundred and Tenth street, 2 mast arm; One Hundred and Tenth street to One Hundred and Thirty-sixth street, 55 mast arm and 25 lyre top 450-watt direct current arc lamps, New York Edison Company; One Hundred and Thirty-sixth street to One Hundred and Fifty-fifth street, 36 mast arm and 17 lyre top 450-watt alternating current arc lamps, United Electric Light and Power Company.

The first lamps were lighted June 13, and as the work of paving progressed the lighting was extended and completed on October 10, 1908.

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Commenting upon this installation, the "Electrical World" stated editorially, under date of November 21, 1908, as follows:

"Some Real Street Lighting.

"The illumination of upper Seventh avenue, New York City, will, we trust, serve as an example to be followed in other cities. It is one of the very few American examples of an adequate amount of illumination well diffused."

FIG. 4.
Lyre Top Post.

Broadway—The largest single installation which has been made for a considerable period was completed upon Broadway, from Columbus circle and Fifty-ninth street to One Hundred and Twenty-seventh street, a distance of over three miles. This street is also a boulevard the same width as Seventh avenue, but laid out somewhat differently, and also has surface car lines.

The line of the street not being straight, this installation does not appear to advantage as compared with Seventh avenue.

This was the first street in the City to be lighted by Welsbach mantle lamps, double burners being installed in 1896; these were changed in 1903 to single burners.

The present installation is of the same general plan as Seventh avenue, as shown in Figure 1, and the posts, lamps, etc., of the same type. The centre plot lamp is controlled from a post on the corner. The total equipment consists of 138 mast arm, 62 lyre top and 4 Bishop's crook posts, making 204 450-watt direct current enclosed arc lamps. The first lamps were lighted October 3, 1908, and, with the exception of 11 lamps, the work was completed on December 12, 1908. Of the remaining 11 lamps, three (3) require special construction in the roof of the subway, and eight (8) will be installed as soon as proposed changes in the subway north of Ninety-sixth street are completed.

The posts used for the former installation of gas lighting, known as the "boulevard" type, are the property of the City, and these were removed and adapted for use with the installation of tungsten incandescent lamps on Riverside drive and in Riverside, St. Nicholas and High Bridge parks.

Riverside Drive and Park—The drive and park extending from Seventy-second to One Hundred and Twenty-ninth street along the western boundary of Manhattan Island contains 140 acres and is nearly three miles in length. The parkway known as Riverside drive forms for its greater part the eastern boundary of the park. The

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former lighting was principally by means of naphtha lamps installed as open flame in 1896 and changed to the mantle type in 1899.

From Seventy-second to One Hundred and Fourth street, thirty-six arc lamps upon mast arm poles of the same type as those used upon Seventh avenue and Broadway were installed. The equipment in this case consisting of 450-watt direct current enclosed arcs, with opalescent inner and clear outer globes.

From One Hundred and Fourth to One Hundred and Twentieth street, the drive is divided by grass plots into two roads, a bridle path and a former bicycle path, which is now used as a foot path, as shown in Fig. 5. Owing to the fact that the trees along this section are very heavy, small units were selected for lighting in the form of Tungsten 81-watt 60-candle-power incandescent lamps on ornamental cast iron posts, as shown in Fig. 6. The installation on the drive consists of eighty lamps; the posts, known as the boulevard type, are the property of the City, having been removed from Broadway when arc lamps were installed upon that thoroughfare. They are one-piece castings, 7 feet 10 inches in height. When it becomes necessary to purchase new posts for use with Tungsten lamps, a post of greater height will be secured.

The lamps are all supplied by means of underground conductors consisting of two and three conductor, lead armored, rubber covered, low tension cable, drawn through a 1½-inch fibre duct.

From sixteen to forty lamps are controlled from one switch, a sample layout being shown in Fig. 5.

The lanterns and their supports, which were supplied by the lighting company, consist of three hinged interlocking sections which provide socket-and-globe holding devices, whereby cleaning and replacing can be easily done.

The lamps are hung pendant, and are enclosed in a globe of clear glass, with a reflector of opal glass and a dome of green glass.

A similar installation was made in Riverside Park, and the mantle naphtha lamps which formerly lighted a part of the park were discontinued. The electric installation consists of one hundred and seventy-three (173) incandescent lamps and one (1) arc lamp on a lyre-top post at the Soldiers' and Sailors' Monument, and was completed and in service on December 30, 1908.

Riverside Drive Extension—The drive north of that portion already described consists of a double driveway, divided by Grant's Tomb, from One Hundred and Twentieth to One Hundred and Twenty-ninth street. From the latter point a viaduct extends across the valley of Manhattanville to One Hundred and Thirty-fifth street. All of this lighting is by means of arc lamps, which were installed several years ago.

The extension of the drive north of One Hundred and Thirty-fifth street was opened as far as One Hundred and Forty-fifth street in December. The entire

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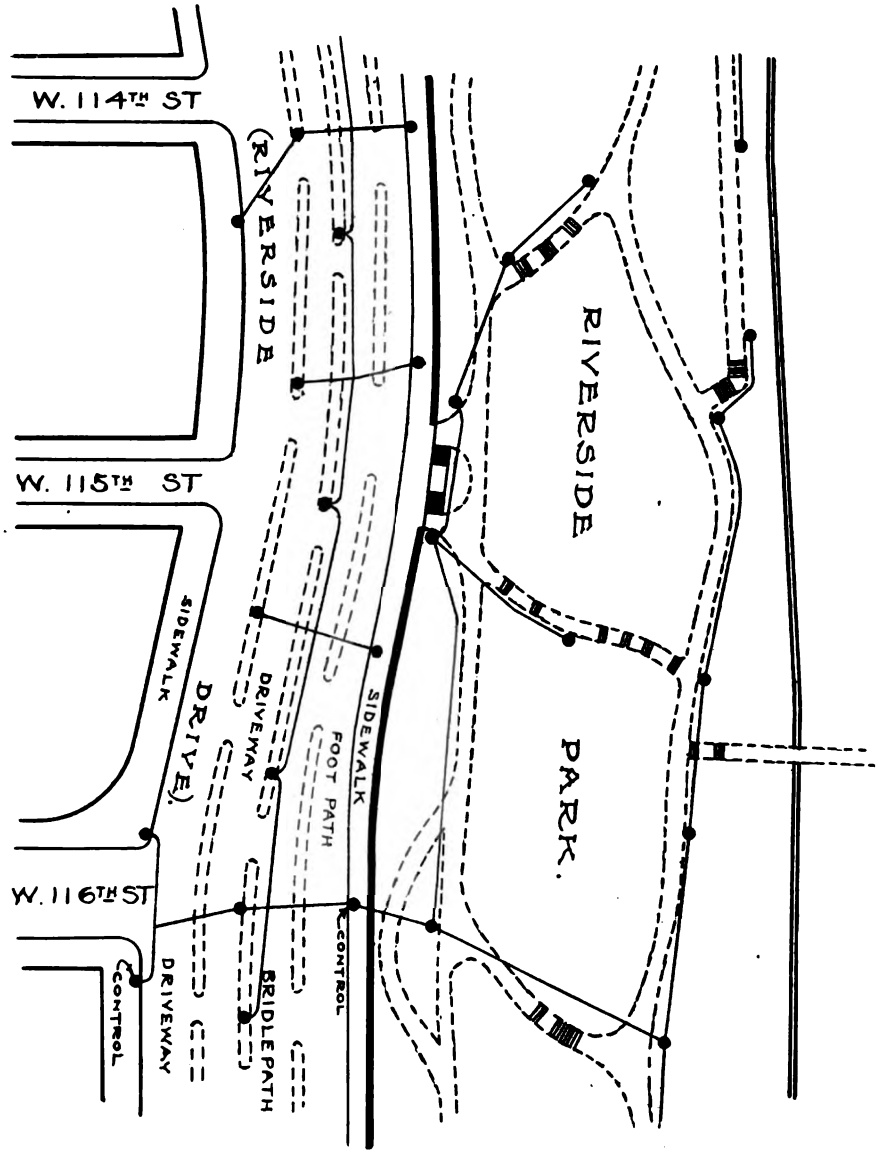


*Fig 5.*

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lighting equipment was installed by the City under supervision of the President of the Borough of Manhattan, the plans except as to the style of incandescent fixture having been revised and approved by this Bureau.

The installation consists of the following units:

One 450-watt alternating current enclosed arc suspended from viaduct at One Hundred and Thirty-eighth street.

Twenty-four 450-watt alternating current enclosed arc erected on posts.

Nine 81-watt Tungsten lamps erected on posts.

Two 81-watt Tungsten lamps in lanterns at the top of stone columns.

Six 3-light and twelve 2-light brackets with 54-watt Tungsten incandescent lamps.

The equipment was turned over to this Department for maintenance and the lamps were lighted on December 11, 1908. On account of the complete installation (except lamps) being made by the City, a reduced price per lamp for maintenance will be asked for in the contract proposals for street lighting next year.

St. Nicholas Park—The grading of this park was completed during the year, and it was decided to install 81-watt, 60-candle-power Tungsten incandescent lamps on boulevard posts, instead of mantle naphtha lamps as originally planned. The park lies between St. Nicholas avenue and St. Nicholas terrace, extending from One Hundred and Thirtieth to One Hundred and Forty-first street, and contains twenty-six acres. The lighting installation consists of one (1) 450-watt arc, and forty-nine (49) 81-watt Tungsten incandescent lamps, and was placed in service December 19, 1908. They are on underground service consisting of two and three conductors protected by eleven separate wrappings of rubber, linen (2) varnished cambric, jute and compound (3) lead, paper and steel tape (2). This cable is simply laid in a trench, and requires no protecting duct.

As in the Riverside drive and park installations, a number of lamps are controlled from a switch located in one post, the cable being looped into and out of each post.

Arc lamps were installed on St. Nicholas terrace, between One Hundred and Twenty-seventh and One Hundred and Thirty-seventh streets on the same date, replacing the mantle naphtha lamps formerly in use on this street.

High Bridge Park—The road and paths leading from Amsterdam avenue and One Hundred and Seventy-fifth street to the Speedway were lighted on December 31, 1908, by means of Tungsten 54-watt 40-candle-power incandescent lamps on boulevard posts, replacing mantle naphtha lamps. The incandescent lamps are served by underground conductors, both of the systems previously described (Riverside drive and St. Nicholas Park) being used.

Lower Manhattan—The practice of improving the lighting in the lower portion of the City by relocating the existing and installing additional arc lamps, was continued; the lighting on all of the streets west of Broadway, south of Vesey street and

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east of Broadway, south of Brooklyn Bridge, being improved during the year, the standard bishop's crook post shown in Fig. 7, being used.

An ornamental twin arc lamp was installed at the junction of Broadway and Park row, in front of the General Post Office Building.

Chelsea Improvement—The Chelsea dock improvement extending from Little West Twelfth street to West Twenty-third street was completed, so far as the marginal street and the plaza west of Eleventh avenue, between Twenty-second and Twenty-third streets were concerned, and electric arc lamps were installed during the year.

Williamsburg Bridge Approach—On Delancey street, between Essex and Clinton streets, where entrances to the Manhattan Subway are located, the lighting was improved by the installation of nine, and the relocating of six arc lamps.

Madison Avenue Temporary Bridge—When the draw span of the Madison Avenue Bridge was moved from One Hundred and Thirty-eighth to One Hundred and Thirty-sixth street in May, to permit of the construction of a new bridge at the old location, thirty-four open flame gas lamps were discontinued on the old approach, and the approach to the temporary bridge north of One Hundred and Thirty-sixth street was lighted by means of four arc lamps.

Queensboro Bridge—Two temporary arc lamps were installed under the Manhattan end of the main span to aid the Watchmen in policing the structure.

University Heights Bridge—This bridge was opened during the year, and one incandescent and seven arc lamps were installed upon the bridge and its Manhattan approach, and in addition nine arc lamps were erected upon the street leading to the bridge from Broadway.

Morningside Avenue West—Other streets on which the lighting system was changed from naphtha to electricity were Morningside Avenue West, from One Hundred and Tenth to One Hundred and Twenty-second street and One Hundred and Twenty-second street west to Riverside drive, mast arm posts being used on the former.

One Hundred and Fifty-fifth Street, West of Boulevard Lafayette—This street leads to the only accessible public dock north of One Hundred and Thirty-fourth street and is therefore very much used for heavy trucking. It has a very steep grade and, owing to the fact that trucks use the curb for a wheel brake, the mantle gas lamps could not be satisfactorily maintained, and they were replaced by arc lamps.

Arc lamps were also installed on the streets in the neighborhood of the amusement parks at Fort George.

Brooklyn Bridge Arches—On account of the shadow cast by the bridge the eight lamps lighting the arches under Brooklyn Bridge were ordered to be kept burning one hour longer than the time called for on the lighting schedule, beginning March 18, 1908.

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FIG. 6.
Boulevard Post (Tungsten)

FIG. 7.
Bishop's Crook Post.

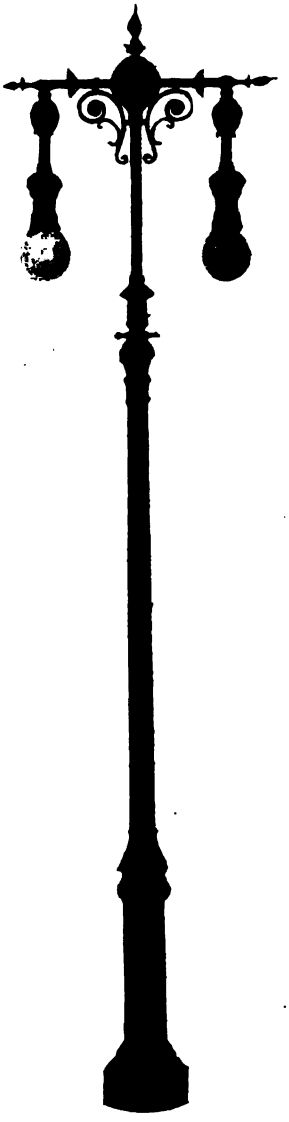

FIG. 8.
Fifth Avenue Post.

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All of the new lamps erected in the Borough of Manhattan will be found in Table J.

BOROUGH OF THE BRONX.

The improvements in street lighting in the Borough of The Bronx were principally made in that portion of the Borough lying east of the Bronx River, as was the case in 1907, as this section has been growing rapidly. The increase in the number of arc lamps was nearly as large as in the previous year but no large single installation was made. The new Pelham Bay Bridge was opened on October 15 and lighted with fifteen arc lamps. The lighting was revised upon a number of important thoroughfares, among which were the following:

Clasons Point road, 7 new arcs and 27 relocated.

Williamsbridge road, 27 relocated.

Eastchester road, 2 new arcs and 22 relocated.

The Grand Boulevard and Concourse was completed in part during the year, but, owing to the fact that no provision was made by the office of the President of the Borough of The Bronx for pipes or conductors, it was impossible to light same. Although the New York Edison Company was ready in the early part of the year to proceed at once with the laying of underground conductors and agreed to replace the contractor's work in the same condition as they found it, the condition of the work and the refusal of the contractors to co-operate made this impossible. A few naphtha lamps (15) were installed where necessary, to provide temporary lighting.

The transverse roads under the Concourse, at Kingsbridge road, Burnside avenue and Tremont avenue were lighted with electric arc lamps and similar lighting installed on Tremont avenue, between the Concourse and Jerome avenue.

Tungsten incandescent lamps were substituted for the carbon type in 369 cases; of the remaining 20, eight (8) are on bridges where it is inadvisable to use the Tungsten lamp owing to vibration; and the balance will be changed during the coming year. In addition to these there were 144 new Tungsten lamps installed replacing mantle naphtha lamps; the largest installation being upon Corsa lane, where 29 81-watt lamps were erected.

The number of gas lamps show an increase of over 200, as comparatively few were discontinued on account of electric arc lighting, and 285 new lamps were installed, the largest installation being upon One Hundred and Eighty-ninth street, between Webster avenue and Southern boulevard, where 27 lamps were erected.

University Heights Bridge, connecting the Boroughs of Manhattan and The Bronx, was opened during the year, the lighting equipment on The Bronx approach consisting of 7 arc and 1 incandescent lamps, the latter being in the shelter house used by the Bridge Attendants.

In addition to the above 6 arc lamps were installed upon streets leading to the bridge.

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Five arc lamps were installed upon the approach to the Madison avenue temporary bridge approach from Mott avenue.

The location of all new lamps erected in the Borough of The Bronx during the year is given in Table K.

BOROUGH OF BROOKLYN.

The work of extending the lighting service to the outlying streets was continued, the increase in number amounting to 546 lamps. This is less than half the increase for the previous year, but the lighting system in this Borough has now been extended to practically meet all necessary requirements and further extensions will only be necessary to keep up with the natural growth.

In the district of the Kings County Lighting Company the balance of the open flame lamps were changed to the mantle type in January, with the exception of ten lamps where certain repairs to the posts were necessary.

The lighting of Broadway from Williamsburg Bridge plaza to Myrtle avenue was rearranged and 17 new arc lamps were installed, and upon the newly opened Grand street extension leading to the plaza, 9 arc lamps were installed.

The location of all new lamps erected in the Borough of Brooklyn during the year is given in Table L.

BOROUGH OF QUEENS.

The work of removing arc lamps from the residential streets and replacing them with smaller units was continued with the result that 278 arc lamps were discontinued during the year.

On the main thoroughfares additional arc lamps numbering 176 were installed while on residential streets there were 1,465 Tungsten and 392 mantle gas lamps installed.

Only a little over half of the Tungsten lamps represented new lighting as the balance replaced mantle naphtha and electric arc lamps.

Mantle naphtha lamps numbering 674 were discontinued during the year leaving 18 in use. Twelve of these are located in Kings Park, and 2 on Highland parkway, which could not be reached to advantage by means of overhead wires. The remaining 4 lamps are upon streets and all will probably be replaced during the coming year.

At Queensboro Bridge two temporary arc lamps were installed upon bridge property to aid in policing the structure.

The location of all new lamps erected in the Borough of Queens during the year is given in Table M.

BOROUGH OF RICHMOND.

The principal improvement in the Borough of Richmond was the installation of 235 mantle gas lamps, part of which replaced 189 carbon incandescent lamps which were discontinued. In addition, 27 new arc lamps were installed.

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The location of all lamps erected in the Borough of Richmond during the year is given in Table N.

The reports from the various Boroughs have been submitted and will be found in another section of the report.

### Repairs to Gas Lamp-posts.

The expense of erecting and repairing gas lamp-posts was less than during the year 1907 by over $20,000; this being due principally to the fact that the cost of purchasing posts belonging to the companies in the Borough of Queens, amounting to nearly $16,000, was included in the former year; and further, the reductions in Brooklyn and Queens were large enough to cover a new expenditure of some $3,800 in Richmond and still leave a balance of over $4,600 in favor of 1908 as compared with 1907.

The figures for the Boroughs of Manhattan and The Bronx show about the same results as in 1907. In Brooklyn the average number of repairs per lamp and the average cost per lamp was considerably reduced.

In the Borough of Queens the average number of repairs per lamp was low but the cost considerably higher than in Manhattan, The Bronx and Brooklyn, due to the fact that the number of lamps erected and reset represented over 10 per cent. of the average number in use.

The figures for the Borough of Richmond are not comparable with those of the other Boroughs, as the 235 gas lamps were not installed until November, making the average number for the year only 36.

### New Lighting Provided for Borough of Manhattan.

Queensboro Bridge—Plans for lighting the first bridge connecting the Boroughs of Manhattan and Queens, known as Queensboro Bridge, by means of arc and incandescent lamps are in preparation.

Blackwells Island—Cables will be laid on Queensboro Bridge to supply current on Blackwells Island. The City is erecting a substation and pole lines and the lighting of the roads and paths will be done by means of arc and incandescent lighting in place of mantle naphtha lamps at present in use. The bridge and island lighting is to be on metered service the same as on Brooklyn and Williamsburg Bridges, in order to secure a greatly reduced rate, but with a separate maintenance charge to insure the most efficient maintenance.

Madison Avenue Bridge—Plans have been submitted by the Department of Bridges and revised by this Bureau for lighting by means of electric arc lamps the proposed new Madison Avenue Bridge to connect the Boroughs of Manhattan and The Bronx at One Hundred and Thirty-eighth street.

Grand Central Terminal—The terminal improvements being made in the vicinity of Grand Central Station provide streets in the form of viaducts over the tracks from Forty-fifth to Forty-ninth street, between Lexington and Madison avenues. Park ave-

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nue, from Forty-ninth to Fifty-seventh streets, will also be a viaduct. Plans have been completed for lighting these streets with arc lamps.

Pennsylvania Terminal—The streets between Fifth avenue and the Hudson River, from Thirtieth to Thirty-fourth street, will require additional lighting on account of increased traffic due to the new Pennsylvania Railroad terminal now under construction, and plans have been prepared for lighting these thoroughfares by means of electric arc lamps—some of the lamps having been installed during the year.

Fifth Avenue Widening—The roadway of Fifth avenue is to be widened, between Twenty-fifth and Forty-seventh streets, from 40 feet to 55 feet, by taking 7 feet 6 inches from each sidewalk; and plans have been prepared to relocate the existing two posts on each block and add one more post to each block. At present there are two 250-watt lamps on each post and this equipment will be changed to two 450-watt lamps on each post. Fifth avenue was lighted by means of arc lamps in 1881 when one open arc was placed at each street intersection displacing three open flame gas lamps. In 1892, at the time of the Columbian celebration, the present system was installed with two posts to each block, the equipment consisting of two open arc lamps to each post. In 1902 the open arc lamps were changed to the enclosed type, the outer globe being of opal instead of clear glass as heretofore, as shown in Figure 8.

Tungsten Lamps—The carbon incandescent lamps in use will be replaced with Tungsten lamps with the exception of a few upon bridges where it would be inadvisable to use the latter type owing to vibration.

In addition to the above mentioned improvements for which plans have been prepared, the following are proposed for the coming year:

Broadway—Continue the arc lighting from Manhattan street to One Hundred and Seventieth street.

Lower Manhattan—Continue the general improvement of the lighting on the streets in this section.

Queensboro and Manhattan Bridge Approaches—Revise lighting on all streets leading to these bridges.

Riverside Drive—Install additional Tungsten lamps from One Hundred and Third to One Hundred and Twentieth street, and replace the present arc lamps with Tungsten lamps around Grant's Tomb.

Madison Square and Union Square Parks—Revise the existing equipment of electric arc lamps and place conductors underground.

Central Park West, Fifty-ninth to One Hundred and Tenth Street, and Morningside Avenue East, One Hundred and Tenth to One Hundred and Twenty-fourth Street—Install electric arc and Tungsten incandescent lamps.

Madison Avenue—Install additional electric arc lamps so that there will be two instead of one to each block.

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Central Park—Install 81-watt 60-candle-power Tungsten incandescent lamps with underground conductors, on roads and paths, replacing existing mantle naphtha lamps, and greatly improve the lighting. It is estimated that about 1,300 lamps will be required to properly light this park.

Morningside Park—Install 81-watt 60-candle-power Tungsten lamps, replacing existing mantle naphtha lamps.

BOROUGH OF THE BRONX.

West Farms Road (Walker Avenue)—Owing to regulating and grading, the existing 27 arc lamps will be relocated and 8 new arc lamps installed, plans for which have been prepared.

Albany Post Road—This street parallels Broadway, from Two Hundred and Forty-second to Two Hundred and Fifty-sixth streets, and as the roadway is in better condition than the latter, it is proposed to light same with Tungsten lamps.

Tungsten Lighting—Orders were issued during the year for the installation of 401 Tungsten lamps displacing mantle naphtha lamps in Williamsbridge, Wakefield and Eastchester, but the work was not completed during the year.

It is proposed to replace as many as possible of the remaining naphtha lamps, especially those in the parks, with Tungsten incandescent lamps, during the coming year.

It is proposed to replace the open flame fire alarm signal lamps in the Borough of The Bronx with mantle lamps equipped with ruby, lettered glass. Three styles of lettering will be required: (1) The style now used in the Borough of Manhattan can be used in this Borough where the signal box is located on the lamp-post. (2) Similar glass lettered on the front glass "Fire alarm box on pole. In case of fire open door by turning the handle, then pull hook inside once only," and on the rear glass "Fire alarm box on pole," will be used where keyless boxes are located on poles near the lamps. (3) Similar glass lettered on front and rear glass, "Fire alarm box on pole, read tin sign" will be used where key boxes are located on poles near the lamps. It is also proposed to extend the system by installing signal lamps near poles having signal boxes thereon where gas mains are in the street.

Similar signal lamps may also be installed in the other Boroughs.

BOROUGH OF BROOKLYN.

Upon the expiration of the contract with the Flatbush Gas Company for arc lighting, it is proposed to change the existing 400-watt arc lamps to the standard 450-watt size.

It is proposed to install Tungsten lamps in place of existing mantle naphtha lamps in the public parks.

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BOROUGH OF QUEENS.

During the coming year it is proposed to change the existing carbon incandescent lamps to the Tungsten type.

The existing arc lamps which are now using 325 watts will be replaced with the standard 450-watt lamps.

As soon as the improvements under way around the Sunnyside Yards of the Long Island Railroad Company, at Long Island City, are completed the five viaducts and all streets leading to same will be lighted.

BOROUGH OF RICHMOND.

A number of tests have been in progress to determine what improved lamps can be substituted to the best advantage for the existing carbon incandescent lamps, and it is hoped to change them over during the coming year.

Park Lamps.

The public parks in the City were lighted by means of open flame gas lamps until the introduction of electric arc lighting in 1881; shortly afterward the lighting in a number of the smaller parks was changed from gas to electric, the lights being supplied from overhead circuits. In Central Park there were a few gas lamps prior to 1895, when 200 open flame naptha lamps were installed. These were followed the next year by 100 more, and by 97 in Riverside drive and Park.

Mantle naphtha lamps were first introduced in October, 1898, when the majority of the open-flame naptha lamps in Central Park were changed to the mantle type. The balance of the lamps in Central Park and also those in most of the other parks were changed over by July 1, 1900, leaving a few open flame naphtha lamps upon the streets and parks which were not changed until 1906.

The first park to be lighted by electric lamps supplied from underground conduits was St. Johns. It was opened in the latter part of 1898, the fixtures and conductors being installed by the Park Department. A number of other parks have since been electrically equipped when opened and the contracting companies have placed their wires underground in several other cases.

It is proposed to do this in Union and Madison squares also during the coming year.

The park lamps in use on December 31, 1908, numbered 2,525, and are given in detail in Table V.

Gas Lighting.

The contracts for public gas lighting from the first one made in 1823, to January 1, 1907, were so drawn as to provide for a single charge for supplying illuminant and maintaining the lamps and another charge for erection and repairs.

On February 1, 1906, the contract forms for the supply of gas and repairs to posts were made separate from those for maintenance and the former were accepted

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for repairs to posts only, owing to litigation over the price of gas. A similar condition existed during the past year.

Since the introduction of mantle gas lamps in 1896 they have been maintained in the Boroughs of Manhattan and The Bronx by a subcontractor, and this subcontractor, the Welsbach Street Lighting Company of America, assumed the maintenance contract in these Boroughs on January 1, 1908. Contracts for repairs to posts were made with the gas companies. The maintenance of all gas and naphtha lamps in the Boroughs of Manhattan, The Bronx and Richmond, and all mantle naphtha lamps in Brooklyn and Queens, is now under direct contract with the Welsbach Street Lighting Company of America and mantle gas lamps in Brooklyn and Queens are maintained by the New York and New Jersey Globe Gas Light Company (Ltd.), except in the district of the Kings County Lighting Company, which holds a long-term contract at $28 per lamp per year, and employs the New York and New Jersey Globe Gas Light Company (Ltd.), as subcontractor.

Map and Record Bureau.

The maps and records showing the location and number of lamps throughout the Greater City have been corrected as the changes have occurred, and all bills for street lighting have been checked as usual.

The locations of all gas lamps in the entire City have been checked by reports of lamp-posts painted.

The map case installed in 1907 for the map of Manhattan having proven satisfactory, a larger and better case was designed for the map of Brooklyn. Two of these cases were ordered and one installed in this office and one in the Brooklyn office.

A new atlas in three volumes is being prepared for The Bronx, and as soon as pole lines are rebuilt in Richmond, lamps will be designated on a similar atlas which has been prepared in duplicate for that Borough.

Manhattan—An inspection was made of this Borough south of Forty-second street and the lamps plotted upon new atlases.

The Bronx—No general inspection made except during painting of gas lamp-posts.

Brooklyn—The electric arc lamps supplied by the Edison Electric Illuminating Company which had been changed to 450-watt type in 1906 and 1907 were listed, checked and counted and it was found that instead of 4,292 450-watt and 244 325-watt lamps there were 4,328 450-watt and 211 325-watt lamps. On January 1, 1908, bills were changed accordingly.

The Flatbush Gas Company, at our request, furnished us with a list of arc lamps supplied by them in the Twenty-ninth Ward and on Ocean parkway. This was checked and revised and a correct copy forwarded to the company. The number of lamps was found to be correct as billed. Arrangements have been made to change the 400-watt lamps supplied by this company to the 450-watt size at the expiration of their present contract, May 1, 1909.

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The Kings County Lighting Company furnished lists showing locations of the open flame gas lamps which were changed to the mantle type, and these were checked by our Inspectors and maps compared and corrected.

Queens—No general inspection except during painting of gas lamp-posts.

Richmond—The arc lamps were counted and it was found that eight lamps were in service which were not billed and these were added on the March bill of the company.

### Special Lighting.

In addition to the lamps which burn throughout the year on the regular City schedule, shown in Table X., the following lamps burn one hour later each morning:

Manhattan—

Gansevoort Market, 13 450-watt arc lamps.

Washington Market, 16 450-watt arc lamps.

Under Brooklyn Bridge, 8 450-watt arc lamps.

Brooklyn—Wallabout Market, 32 325-watt arc lamps,

The following burn during summer months only:

Manhattan—Central Park, 7 mantle naphtha lamps.

Brooklyn—

Seaside Park, 10 450-watt arc lamps.

Prospect Park, 12 450-watt arc lamps.

Queens—Rockaway, 9 325-watt arc lamps, 71 mantle gas lamps.

The following burn during skating season only:

The Bronx—

Van Courtlandt Park, 9 450-watt arc lamps.

Crotona Park—5 450-watt arc lamps, 8 mantle naphtha lamps.

Brooklyn—Prospect Park, 10 450-watt arc lamps.

### Bridge Lighting.

The lighting of bridges and viaducts is under the jurisdiction of this Department, but the latter are merely considered as highways.

The arrangements for lighting bridges are of four kinds: Regular street service, meter service, isolated plant and private supply.

Those on street service number 156 and are included in the figures given in Tables A to G.

There are three bridges upon meter basis and a fourth will shortly be opened. The lamps in use at the present time on this basis number 272.

Only two bridges have isolated plants and the lamps in use number 70.

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The Interborough Rapid Transit Company use two bridges open to the public and furnish 117 lamps for the lighting of same.

There were 459 bridge lamps in use on December 31, 1908, in addition to those given on Tables A to G, and they are given in detail on Table V.

### Open Flame Gas Lamps.

The number of open flame gas lamps has decreased from 2,556 to 128, and those in use December 31, 1908, are located as follows:

| | |
|---|---|
| Manhattan— | |
| Madison Avenue Bridge | 29 |
| Putnam Railroad Bridge | 3 |
| Ex-Mayors Hewitt, Grace, Wickham and Gilroy | 8 |
| The Bronx— | |
| Fire alarm signal lamps | 80 |
| Putnam Railroad Bridge | 6 |
| Brooklyn—Society for the Prevention of Cruelty to Children | 2 |

### Fire Alarm Signal Lamps.

The fire alarm signal lamps in the Borough of Manhattan are all of the mantle type and those in The Bronx will be changed from open flame to that type.

### Mayors' Lamps.

The lamps in use before the houses of the Mayor and ex-Mayors of New York City on December 31, 1908, are shown in Table T.

### Free Lamps.

The situation regarding free lamps has not changed materially since my report of 1907; the number is still in question in both the Borough of The Bronx and the Borough of Brooklyn.

There are no free lamps in the Borough of Richmond, and the number in the Borough of Manhattan has not altered.

In the Borough of Queens the number of free lamps has been increased by the addition of one arc and six 50-55-watt incandescent lamps. The total number of free lamps on December 31, 1908, was 192, and they are shown in detail on Tables A to G.

### General.

Mileage—The mileage of streets lighted shows an increase of about one mile in Manhattan and nine miles in The Bronx. As in the previous year, the largest single increase was in electric arc lighting in Manhattan. The largest increase in The Bronx was in gas lighting, about five miles.

These figures are given in detail in Table Q.

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Time Clocks—The time clocks which were placed upon arc lamps for trial have been continued in use but have not given the satisfaction which would warrant their adoption for general use.

Outages—The total number of outages deducted for 1908 was only 102,723 as against 152,893 for 1907, the reduction being due principally to the lamplighters' strike in 1907. The number of arc lamp outages has been reduced in Manhattan, The Bronx and Richmond, and the number of outages in incandescent lamps in the last named Borough was only one quarter of 1907. The change in the Kings County District of Brooklyn from open flame to mantle has reduced the outages by over 11,000.

These figures are given in detail in Table W.

Time Table—The lighting schedule for public street lamps, given in Table X, shows an additional 12 hours and 5 minutes on account of leap year.

Bids—The bids submitted by the various lighting companies for the year 1909 are given in Table Y.

### Lamplighters' Strike.

On the night of August 27 we were again rather suddenly confronted with a very serious matter in the way of a strike of the lamplighters of the Welsbach Street Lighting Company.

On returning from a visit to a section of the city in which electric lighting prevailed, the writer was surprised to note the number of gas and naphtha lamps not lighted and not burning properly, and at first attributed it to the high winds prevailing at the time; but on continuing my observations, became convinced that the conditions were due to something far more serious. Little could be done at the time beyond cautioning the lighting company to use their most strenuous efforts to get the lamps lighted and to allow them to remain lighted the following day if necessary to insure their being lighted the following night.

On interviewing the Superintendent of the company the next morning I was informed that the trouble had been brewing for some time and he had kept closely in touch with the situation, but as only a few of the 600 men were dissatisfied and as he had not been approached by any committee representing the men, no demonstration had been expected at the time.

About thirty of the men, he explained, had assumed control of a meeting on the previous afternoon and locking the doors had prevented a number of the others from leaving in time to take care of their districts.

He also stated that most of the men had reported that morning and expressed their desire to continue at work and new men had been appointed to take the place of those who had not reported, and a sufficient number of extra men employed to provide for any emergencies that might arise.

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After looking over the situation further he reported that in the vicinity of the meeting hall, or, in other words, on Second, Third, Fourth and Fifth streets, between Avenue A and Third avenue, there was danger of the lighters being molested.

Request was therefore made to the Police Department to provide police protection for the lighters in this section and also for the special lighters where necessary, and Deputy Commissioner Baker stated that same would be done.

The lighting company was instructed to commence lighting earlier than usual and our Inspectors were instructed to notify the company by 'phone of any sections they found unlighted and to notify the writer at this office of any disturbance or anything requiring special attention that came to their notice.

During the strike of last year (1907) the Consolidated Gas Company, co-operating with the Welsbach Street Lighting Company, rendered such efficient service that we again invited their assistance, but were informed that as they (the Gas Company) were not in any way liable under the present contract they did not care to place themselves in the position of strike breakers.

On Sunday, August 30, the Welsbach Street Lighting Company informed me that gangs of strikers were visiting the homes of the lighters and intimidating them and trouble was feared in Williamsbridge, Wakefield and in the Washington Heights section of Manhattan. The Police Department was notified and agreed to use their best effort in breaking up these gangs.

While evidences of the strike were apparent until the night of August 31, on only the first night were they so bad as to call for comment by the public or the newspapers.

Little difficulty was experienced in keeping the lamps lighted after the first few days, but reports of deeds of physical violence and intimidation by the strikers continued for nearly a month.

Respectfully submitted,

WM. G. QUIRK, General Inspector of Street Lighting.

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## TABLE A.

Showing Changes in Number of Lamps During Year 1908, by Contractors' Districts, in the Borough of Manhattan.

| Company and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discontinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| ELECTRIC. | | | | | | |
| New York Edison Company. | | | | | | |
| Edison District— | | | | | | |
| Arc, 450 watts..... | *3,499 | 406 | 2 | 3 | *3,904 | 3,699 |
| Twin arc, 500 watts..... | 208 | 1 | .... | .... | 209 | 208 |
| Arc, 325 watts..... | 24 | .... | .... | .... | 24 | 24 |
| Incandescent, 90-100 watts... | 143 | .... | 2 | 2 | 143 | 143 |
| Incandescent, 81 watts..... | .... | 302 | .... | .... | 302 | 23 |
| United District— | | | | | | |
| Arc, 450 watts..... | 255 | 123 | 1 | 1 | 378 | 283 |
| Incandescent, 90-100 watts... | 4 | 1 | .... | .... | 5 | 5 |
| Incandescent, 54 watts..... | .... | 59 | .... | .... | 59 | 5 |
| Incandescent, 81 watts..... | .... | 11 | .... | .... | 11 | 1 |
| Total, arc..... | *3,986 | 530 | 3 | 4 | *4,515 | 4,114 |
| Total, incandescent.... | 147 | 373 | 2 | 2 | 520 | 177 |
| Total, electric..... | *4,133 | 903 | 5 | 6 | *5,035 | 4,291 |
| GAS. | | | | | | |
| Welsbach Street Lighting Company. | | | | | | |
| Mantle ..... | 15,425 | 71 | 538 | 1,345 | 14,689 | 15,259 |
| Open flame..... | 75 | .... | 30 | 65 | 40 | 54 |
| Total, gas..... | 15,500 | 71 | 568 | 1,410 | 14,729 | 15,313 |
| NAPHTHA. | | | | | | |
| Welsbach Street Lighting Company. | | | | | | |
| Mantle ..... | 1,119 | .... | 10 | 267 | 862 | 1,094 |
| Grand total, Manhattan | *20,752 | 974 | 583 | 1,683 | *20,626 | 20,698 |

* In addition to the above, there are 23 450-watt arc lamps furnished free by the New York Edison Company.

Arc lamps burning one hour longer than schedule numbered 30, January to March, and 37, March to December.

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## TABLE B.

Showing Changes in Number of Lamps During Year 1908, by Contractors' Districts, in the Borough of The Bronx.

| Company and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discontinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| ELECTRIC. | | | | | | |
| New York Edison Company. | | | | | | |
| Edison District— | | | | | | |
| Arc, 450 watts..... | *1,297 | 92 | 18 | 18 | *1,389 | 1,333 |
| Incandescent, 90-100 watts... | 374 | .... | .... | 370 | 4 | 345 |
| Incandescent, 54 watts..... | .... | 50 | 369 | .... | 419 | 36 |
| Westchester Lighting Company District— | | | | | | |
| Arc, 450 watts..... | *258 | 28 | .... | 5 | *281 | 263 |
| Incandescent, 90-100 watts... | 16 | .... | .... | .... | 16 | 16 |
| Bronx Gas and Electric Company. | | | | | | |
| Arc, 400 watts..... | 760 | 24 | .... | 2 | 782 | 769 |
| Incandescent, 81 watts..... | .... | 92 | .... | .... | 92 | 21 |
| Total, arc..... | *2,315 | 144 | 18 | 25 | *2,452 | 2,365 |
| Total, incandescent.... | 390 | 142 | 369 | 370 | 531 | 418 |
| Total, electric..... | *2,705 | 286 | 387 | 395 | *2,983 | 2,783 |
| GAS. | | | | | | |
| Welsbach Street Lighting Company of America. | | | | | | |
| Mantle ..... | 5,992 | 285 | 100 | 174 | 6,203 | 6,047 |
| Open flame..... | 88 | .... | .... | 2 | 86 | 87 |
| Total, gas..... | 6,080 | 285 | 100 | 176 | 6,289 | 6,134 |
| NAPHTHA. | | | | | | |
| Welsbach Street Lighting Company of America. | | | | | | |
| Mantle ..... | 1,888 | 35 | 14 | 149 | 1,788 | 1,882 |
| Grand total, The Bronx | *10,673 | 606 | 501 | 720 | *11,060 | 10,799 |
| Grand total, Manhattan and The Bronx..... | 31,425 | 1,580 | 1,084 | 2,403 | 31,686 | 31,497 |

* In addition to the above, there are 1 450-watt arc lamp furnished free by the New York Edison Company, and 8 in the district of the Westchester Lighting Company, the price of which is in question.

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## TABLE C.

Showing Changes in Number of Lamps During Year 1908, by Contractors' Districts, in the Borough of Brooklyn.

| Company and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discon-tinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| ELECTRIC. | | | | | | |
| Edison Electric Illuminating Company of Brooklyn. | | | | | | |
| Arc, 450 watts | *4,214 | 84 | 32 | 48 | *4,282 | 4,255 |
| Arc, 325 watts | 211 | 2 | .... | 2 | 211 | 211 |
| Flatbush Gas Company. | | | | | | |
| Arc, 450 watts | 66 | .... | .... | .... | 66 | 66 |
| Arc, 400 watts | 740 | 10 | 3 | 3 | 750 | 743 |
| Total, electric | *5,231 | 96 | 35 | 53 | *5,309 | 5,275 |
| GAS. | | | | | | |
| New York and New Jersey Globe Gas Light Company. | | | | | | |
| Brooklyn Union Gas Company, mantle | 12,899 | 376 | 219 | 238 | 13,256 | 12,996 |
| Brooklyn Borough Gas Company, mantle | 282 | 104 | 6 | 7 | 385 | 310 |
| Kings County Lighting Company. | | | | | | |
| Mantle | 2,159 | 8 | 2,391 | .... | 4,558 | 4,370 |
| Open flame | 2,391 | .... | .... | 2,391 | .... | 187 |
| Brooklyn Union Gas Company. | | | | | | |
| Open flame | 2 | .... | .... | .... | 2 | 2 |
| Total, mantle | 15,340 | 488 | 2,616 | 245 | 18,199 | 17,676 |
| Total, open flame | 2,393 | .... | .... | 2,391 | 2 | 189 |
| Total, gas | 17,733 | 488 | 2,616 | 2,636 | 18,201 | 17,865 |
| NAPHTHA. | | | | | | |
| Welsbach Street Lighting Company of America. | | | | | | |
| Mantle | 656 | .... | .... | .... | 656 | 656 |
| Open flame | 12 | .... | .... | .... | 12 | 12 |
| Total, naphtha | 668 | .... | .... | .... | 668 | 668 |
| Grand total, Brooklyn | *23,632 | 584 | 2,651 | 2,689 | *24,178 | 23,808 |

* In addition to the above there are 114 450-watt free arc lamps. The company claims, however, that there are only 29 325-watt free lamps.

In Wallabout Market, 32 325-watt arc lamps burn one hour longer than schedule.

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## TABLE D.

Showing Changes in Number of Lamps During Year 1908, by Contractors' Districts, in the Borough of Queens.

| Company and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discontinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| ELECTRIC. | | | | | | |
| New York and Queens Electric Light and Power Company | | | | | | |
| Arc, 325 watts..... | *2,149 | 155 | .... | 278 | *2,026 | 2,094 |
| Incandescent, 90-100 watts..... | *146 | .... | .... | .... | *146 | 146 |
| Incandescent, 54 watts..... | 92 | 1,030 | .... | 8 | 1,114 | 329 |
| Incandescent, 81 watts..... | .... | 430 | .... | 1 | 429 | 149 |
| Queens Borough Gas and Electric Company. | | | | | | |
| Arc, 325 watts..... | 249 | 21 | 12 | 14 | 268 | 252 |
| Incandescent, 80 watts..... | 23 | 5 | .... | .... | 28 | 25 |
| Total, arc..... | 2,398 | 176 | 12 | 292 | 2,294 | 2,346 |
| Total, incandescent.... | 261 | 1,465 | .... | 9 | 1,717 | 649 |
| Total, electric..... | *2,659 | 1,641 | 12 | 301 | *4,011 | 2,995 |
| GAS. | | | | | | |
| New York and New Jersey Globe Gas Light Company. | | | | | | |
| Bayside, mantle..... | 73 | 4 | 1 | 1 | 77 | 75 |
| Whitestone, mantle..... | 40 | .... | 6 | .... | 46 | 40 |
| College Point, mantle..... | 190 | 4 | 5 | 17 | 182 | 188 |
| Flushing, mantle..... | 236 | 4 | 1 | 13 | 228 | 236 |
| Newtown, mantle..... | 2,356 | 185 | 49 | 102 | 2,488 | 2,370 |
| Woodhaven, mantle..... | 471 | 61 | 3 | 3 | 532 | 488 |
| Richmond Hill, mantle..... | 467 | 50 | 3 | 9 | 511 | 482 |
| Jamaica, mantle..... | 152 | 82 | 2 | 14 | 222 | 187 |
| Arverne and Rockaway, mantle. | 325 | 21 | 53 | 82 | 317 | 293 |
| Total, gas..... | 4,310 | 411 | 123 | 241 | 4,603 | 4,359 |

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| Company and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discon-tinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burn-ing During Year. |
|---|---|---|---|---|---|---|
| NAPHTHA. | | | | | | |
| Welsbach Street Lighting Company of America. | | | | | | |
| Bayside, mantle..... | 23 | .... | .... | 23 | .... | 19 |
| College Point, mantle..... | 19 | .... | .... | 19 | .... | 12 |
| Flushing, mantle..... | 13 | .... | .... | 13 | .... | 10 |
| Newtown, mantle..... | 448 | .... | 1 | 444 | 5 | 344 |
| Richmond Hill, mantle..... | 42 | .... | 1 | 43 | .... | 27 |
| Jamaica, mantle..... | 145 | .... | .... | 132 | 13 | 116 |
| Total, naphtha..... | 690 | .... | 2 | 674 | 18 | 528 |
| Grand total, Queens... | *7,659 | 2,052 | 137 | 1,216 | *8,632 | 7,882 |

* In addition to the above, there were 25 325-watt arc and 14 90-100-watt incandescent lamps furnished free by the company from January 1 to December 1. Beginning December 1, 1 arc and 6 54-watt incandescent lamps were added, making a total of free lamps at end of year as follows: 26 325-watt arc, 14 90-100-watt incandescent, 6 54-watt incandescent.

## TABLE E.

Showing Changes in Number of Lamps During Year 1908, by Contractors' Districts, in the Borough of Richmond.

| Company and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discon-tinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burn-ing During Year. |
|---|---|---|---|---|---|---|
| ELECTRIC. | | | | | | |
| Richmond Light and Railroad Company. | | | | | | |
| Arc, 450 watts..... | 664 | 27 | 8 | .... | 699 | 685 |
| Incandescent, 90-100 watts..... | 3,933 | .... | .... | 189 | 3,744 | 3,918 |
| Total, electric..... | 4,597 | 27 | 8 | 189 | 4,443 | 4,603 |
| GAS. | | | | | | |
| Welsbach Street Lighting Company of America. | | | | | | |
| Mantle ..... | .... | 235 | .... | .... | 235 | 36 |
| Grand total, Richmond. | 4,597 | 262 | 8 | 189 | 4,678 | 4,639 |

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## TABLE F.

Showing Changes in Number of Lamps During Year 1908, by Boroughs.

| Borough and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discontinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| MANHATTAN. | | | | | | |
| Electric. | | | | | | |
| Arc | 3,986 | 530 | 3 | 4 | 4,515 | 4,114 |
| Incandescent | 147 | 373 | 2 | 2 | 520 | 177 |
| Total, electric | 4,133 | 903 | 5 | 6 | 5,035 | 4,291 |
| Gas. | | | | | | |
| Mantle | 15,425 | 71 | 538 | 1,345 | 14,689 | 15,259 |
| Open flame | 75 | .... | 30 | 65 | 40 | 54 |
| Total, gas | 15,500 | 71 | 568 | 1,410 | 14,729 | 15,313 |
| Naphtha. | | | | | | |
| Mantle | 1,119 | .... | 10 | 267 | 862 | 1,094 |
| Grand total, Manhattan | 20,752 | 974 | 583 | 1,683 | 20,626 | 20,698 |
| THE BRONX. | | | | | | |
| Electric. | | | | | | |
| Arc | 2,315 | 144 | 18 | 25 | 2,452 | 2,365 |
| Incandescent | 390 | 142 | 369 | 370 | 531 | 418 |
| Total, electric | 2,705 | 286 | 387 | 395 | 2,983 | 2,783 |
| Gas. | | | | | | |
| Mantle | 5,992 | 285 | 100 | 174 | 6,203 | 6,047 |
| Open flame | 88 | .... | .... | 2 | 86 | 87 |
| Total, gas | 6,080 | 285 | 100 | 176 | 6,289 | 6,134 |
| Naphtha. | | | | | | |
| Mantle | 1,888 | 35 | 14 | 149 | 1,788 | 1,882 |
| Grand total, The Bronx | 10,673 | 606 | 501 | 720 | 11,060 | 10,799 |
| BROOKLYN. | | | | | | |
| Electric. | | | | | | |
| Arc | 5,231 | 96 | 35 | 53 | 5,309 | 5,275 |

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| Borough and Kind of Lamp. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discontinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| Gas. | | | | | | |
| Mantle | 15,340 | 488 | 2,616 | 245 | 18,199 | 17,676 |
| Open flame | 2,393 | .... | .... | 2,391 | 2 | 189 |
| Total, gas | 17,733 | 488 | 2,616 | 2,636 | 18,201 | 17,865 |
| Naphtha. | | | | | | |
| Mantle | 656 | .... | .... | .... | 656 | 656 |
| Open flame | 12 | .... | .... | .... | 12 | 12 |
| Total, naphtha | 668 | .... | .... | .... | 668 | 668 |
| Grand total, Brooklyn. | 23,632 | 584 | 2,651 | 2,689 | 24,178 | 23,808 |
| QUEENS. | | | | | | |
| Electric. | | | | | | |
| Arc | 2,398 | 176 | 12 | 292 | 2,294 | 2,346 |
| Incandescent | 261 | 1,465 | .... | 9 | 1,717 | 649 |
| Total, electric | 2,659 | 1,641 | 12 | 301 | 4,011 | 2,995 |
| Gas. | | | | | | |
| Mantle | 4,310 | 411 | 123 | 241 | 4,603 | 4,359 |
| Naphtha. | | | | | | |
| Mantle | 690 | .... | 2 | 674 | 18 | 528 |
| Grand total, Queens | 7,659 | 2,052 | 137 | 1,216 | 8,632 | 7,882 |
| RICHMOND. | | | | | | |
| Electric. | | | | | | |
| Arc | 664 | 27 | 8 | .... | 699 | 685 |
| Incandescent | 3,933 | .... | .... | 189 | 3,744 | 3,918 |
| Total, electric | 4,597 | 27 | 8 | 189 | 4,443 | 4,603 |
| Gas. | | | | | | |
| Mantle | .... | 235 | .... | .... | 235 | 36 |
| Grand total, Richmond. | 4,597 | 262 | 8 | 189 | 4,678 | 4,639 |
| Grand total, all Boroughs | 67,313 | 4,478 | 3,880 | 6,497 | 69,174 | 67,826 |

In addition to the above, there were 185 at the beginning, and 192 free lamps at the end of the year. (See Borough tables.)

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## TABLE G.

Resumé Showing Changes in the Number of Lamps During the Year 1908, in the Greater City.

| Kind of Lighting. | Number of Lamps January 1, 1908. | New Lamps Lighted. | Lamps Re-lighted. | Lamps Discon-tinued. | Number of Lamps December 31, 1908. | Average Number of Lamps Burning During Year. |
|---|---|---|---|---|---|---|
| Electric. | | | | | | |
| Arc | *14,594 | 973 | 76 | 374 | *15,269 | 14,785 |
| Incandescent | 4,731 | 1,980 | 371 | 570 | 6,512 | 5,162 |
| Total, electric | *19,325 | 2,953 | 447 | 944 | *21,781 | 19,947 |
| Gas. | | | | | | |
| Mantle | 41,067 | 1,490 | 3,377 | 2,005 | 43,929 | 43,377 |
| Open flame | 2,556 | .... | 30 | 2,458 | 128 | 330 |
| Total, gas | 43,623 | 1,490 | 3,407 | 4,463 | 44,057 | 43,707 |
| Naphtha. | | | | | | |
| Mantle | 4,353 | 35 | 26 | 1,090 | 3,324 | 4,160 |
| Open flame | 12 | .... | .... | .... | 12 | 12 |
| Total, naphtha | 4,365 | 35 | 26 | 1,090 | 3,336 | 4,172 |
| Grand total | *67,313 | 4,478 | 3,880 | 6,497 | *69,174 | 67,826 |

* In addition to the above there were 185 free lamps at the beginning and 192 free lamps at the end of the year. See Borough tables.

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## TABLE I.

Showing the Number and Cost of Repairs to Gas Lamp-posts Owned by the City During the Year 1908.

| Borough and Company. | Average Number of Gas Lamps. | Number of Repairs. | Cost of Repairs. | Average Number of Repairs Per Lamp. | Average Cost of Repairs Per Lamp. | Additional Cost of Painting Per Lamp. |
|---|---|---|---|---|---|---|
| Manhattan. | | | | | | |
| Consolidated Gas Company... | 15,313 | 2,991 | $10,367 00 | .19530 | $0 67700 | $0 20 |
| The Bronx. | | | | | | |
| Consolidated Gas Company... | 6,134 | 943 | 4,890 25 | .15373 | 79723 | 25 |
| Total, Manhattan and The Bronx..... | 21,447 | 3,934 | $15,257 25 | .18342 | $0 71139 | .... |
| Brooklyn. | | | | | | |
| Brooklyn Union Gas Company | 12,998 | 1,733 | $8,774 00 | .13332 | $0 67502 | $0 20 |
| Brooklyn Borough Gas Company | 310 | 93 | 693 50 | .30000 | 2 23709 | 20 |
| Kings County Lighting Company ..... | 4,557 | 676 | *3,745 50 | .14832 | 82192 | †.... |
| Total, Brooklyn..... | 17,865 | 2,502 | $13,213 00 | .14005 | $0 73960 | .... |
| Queens. | | | | | | |
| New York and Queens Gas Company ..... | 539 | 40 | $273 00 | .07421 | $0 50649 | $0 20 |
| Newtown Gas Company..... | 2,370 | 229 | 2,090 50 | .09662 | 88206 | 20 |
| Woodhaven Gas Light Company | 488 | 104 | 897 50 | .21311 | 1 83913 | 20 |
| Richmond Hill and Queens County Gas Light Company. | 482 | 81 | 685 00 | .16804 | 1 42116 | 20 |
| Jamaica Gas Light Company... | 187 | 98 | 893 50 | .52406 | 4 77807 | 20 |
| Queens Borough Gas and Electric Company..... | 293 | 30 | 179 00 | .10238 | 61092 | 20 |
| Total, Queens..... | 4,359 | 582 | $5,018 50 | .13351 | $1 15129 | .... |
| Richmond. | | | | | | |
| New York and Richmond Gas Company ..... | 36 | 414 | $3,832 50 | 11.50000 | $106 45833 | ‡.... |
| Grand total, Greater City ..... | 43,707 | 7,432 | $37,321 25 | .17004 | $0 85389 | .... |

* This includes $187.50 for work done in 1907.

† Painting is included in charge for maintenance. Charge for main and service repairing, amounting to $5,580.15, $433.55 of which was for work done in 1907, not included.

‡ Posts were installed in November and December, and charge for painting was included in charge for erection.

Gas lamp-posts repaired at expense of private parties are not included, and are given in Table H of report of General Inspector Porcella.

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## TABLE

Showing the Number and Kind of Repairs Made to Gas Lamp-

| Borough and Company. | Erected. | Removed. | Reset. | Reset to Grade. |
|---|---|---|---|---|
| **Manhattan.** | | | | |
| Consolidated Gas Company | 70 | 1,140 | 241 | 62 |
| **The Bronx.** | | | | |
| Consolidated Gas Company | 266 | 430 | 89 | 1 |
| Total, Manhattan and The Bronx | 336 | 1,570 | 330 | 63 |
| **Brooklyn.** | | | | |
| Brooklyn Union Gas Company | 365 | 847 | 113 | 43 |
| Brooklyn Borough Gas Company | 89 | 1 | 3 | .. |
| Kings County Lighting Company | .. | 275 | 275 | *126 |
| Total, Brooklyn | 454 | 1,123 | 391 | 169 |
| **Queens.** | | | | |
| New York and Queens Gas Company | 17 | 11 | 4 | .. |
| Newtown Gas Company | 178 | 9 | 19 | 7 |
| Woodhaven Gas Light Company | 61 | 21 | 21 | .. |
| Richmond Hill and Queens County Gas Light Company. | 50 | 17 | 12 | .. |
| Jamaica Gas Light Company | 82 | 12 | 3 | .. |
| Queens Borough Gas and Electric Company | 2 | 28 | .. | .. |
| Total, Queens | 390 | 98 | 59 | 7 |
| **Richmond.** | | | | |
| New York and Richmond Gas Company | 235 | 179 | .. | .. |
| Total, Greater New York | 1,415 | 2,970 | 780 | 239 |

Lamp-posts removed or reset, or both, at expense of private parties not included.

* Includes twenty-five lamps reset to grade in 1907.

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H.

posts, by Companies, During the Year 1908, in the Greater City.

| Straightened. | Columns Refitted. | Columns Releaded. | Columns Recaulked. | Service Pipes Refitted. | Standpipes Refitted. | Total. | No. of Lamp-posts Painted. |
|---|---|---|---|---|---|---|---|
| 479 | 69 | 328 | 196 | 196 | 210 | 2,991 | 14,528 |
| 37 | 6 | 8 | 1 | 60 | 45 | 943 | 6,113 |
| 516 | 75 | 336 | 197 | 256 | 255 | 3,934 | 20,641 |
| 57 | 11 | 199 | .. | 43 | 55 | 1,733 | 13,003 |
| .. | .. | .. | .. | .. | .. | 93 | 300 |
| .. | .. | .. | .. | .. | .. | 676 | †4,558 |
| 57 | 11 | 199 | .. | 43 | 55 | 2,502 | 17,861 |
| 2 | .. | 1 | .. | 3 | 2 | 40 | 539 |
| 4 | .. | .. | .. | 8 | 4 | 229 | 2,332 |
| .. | .. | .. | .. | .. | 1 | 104 | 489 |
| 1 | .. | .. | .. | 1 | .. | 81 | 494 |
| .. | .. | 1 | .. | .. | .. | 98 | 195 |
| .. | .. | .. | .. | .. | .. | 30 | 315 |
| 7 | .. | 2 | .. | 12 | 7 | 582 | 4,364 |
| .. | .. | .. | .. | .. | .. | 414 | ‡.. |
| 580 | 86 | 537 | 197 | 311 | 317 | 7,432 | 42,866 |

† Painting included in charge for maintenance.

‡ Lamps erected late in year and painting was included in charge for erection.

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TABLE

Showing Number, Kind and Cost of Repairs to Gas Lamp-posts, from

| Year. | Erected. | Removed. | Reset. | Reset to Grade. | Straightened. | Columns Refitted. | Columns Releaded. | Columns Recaulked. |
|---|---|---|---|---|---|---|---|---|
| Manhattan. | | | | | | | | |
| 1903..... | 107 | 326 | 646 | .. | 1,096 | 99 | 1,043 | 245 |
| 1904..... | 86 | 360 | 320 | .. | 1,071 | 182 | 766 | 646 |
| 1905..... | 150 | 497 | 292 | .. | 609 | 130 | 442 | 341 |
| 1906..... | 125 | 548 | 263 | .. | 997 | 73 | 372 | 254 |
| 1907..... | 78 | 785 | 285 | .. | 751 | 103 | 347 | 336 |
| 1908..... | 70 | 1,140 | 241 | 62 | 479 | 69 | 328 | 196 |
| The Bronx. | | | | | | | | |
| 1903..... | 92 | 306 | 387 | .. | 255 | 4 | 178 | 25 |
| 1904..... | 200 | 295 | 257 | .. | 758 | 5 | 267 | 3 |
| 1905..... | 434 | 563 | 354 | .. | 49 | 1 | 34 | 8 |
| 1906..... | 191 | 451 | 200 | .. | 17 | .. | 12 | 1 |
| 1907..... | 247 | 394 | 131 | .. | 51 | 6 | 17 | 1 |
| 1908..... | 266 | 430 | 89 | 1 | 37 | 6 | 8 | 1 |
| Manhattan and The Bronx. | | | | | | | | |
| 1903..... | 199 | 632 | 1,033 | .. | 1,351 | 103 | 1,221 | 270 |
| 1904..... | 286 | 655 | 577 | .. | 1,829 | 187 | 1,033 | 649 |
| 1905..... | 584 | 1,060 | 646 | .. | 658 | 131 | 476 | 349 |
| 1906..... | 316 | 999 | 463 | .. | 1,014 | 73 | 384 | 255 |
| 1907..... | 325 | 1,179 | 416 | .. | 802 | 109 | 364 | 337 |
| 1908..... | 336 | 1,570 | 330 | 63 | 516 | 75 | 336 | 197 |

* Painting included in charge for gas supply and maintenance.

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J.

1903 to 1908, Inclusive, in the Boroughs of Manhattan and The Bronx.

| Service Pipes Refitted. | Stand-Pipes Re-fitted. | Total. | Cost. | Painted. | Average Number of Repairs Per Lamp. | Average Cost of Repairs Per Lamp. | Average Number of Lamps. |
|---|---|---|---|---|---|---|---|
| 355 | 376 | 4,293 | $14,588 80 | *.... | .23778 | $0 80806 | 18.054 |
| 378 | 504 | 4,313 | 12,776 00 | *.... | .24459 | 72394 | 17,634 |
| 350 | 391 | 3,202 | 10,997 00 | *.... | .18350 | 63040 | 17,443 |
| 177 | 183 | 2,992 | 9,368 00 | 15,862 | .17902 | 56052 | 16,713 |
| 220 | 223 | 3,128 | 10,109 50 | 15,407 | .19477 | 62952 | 16,059 |
| 196 | 210 | 2,991 | 10,367 00 | 14,528 | .19530 | 67700 | 15,313 |
| 47 | 1 | 1,295 | $5,946 75 | *.... | .23030 | $1 05757 | 5,623 |
| 76 | 39 | 1,900 | 6,722 25 | *.... | .33100 | 1 17153 | 5,738 |
| 194 | 239 | 1,876 | 9,375 75 | *.... | .31700 | 1 58454 | 5,917 |
| 71 | 80 | 1,023 | 5,255 00 | 5,987 | .16965 | 87147 | 6,030 |
| 78 | 97 | 1,022 | 5,215 75 | 5,819 | .17090 | 87219 | 5,980 |
| 60 | 45 | 943 | 4,890 25 | 6,113 | .15373 | 79723 | 6,134 |
| 402 | 377 | 5,588 | $20,535 55 | *.... | .23600 | $0 86732 | 23,677 |
| 454 | 543 | 6,213 | 19,498 25 | *.... | .26600 | 83400 | 23,372 |
| 544 | 630 | 5,078 | 20,372 75 | *.... | .21740 | 87160 | 23,360 |
| 248 | 263 | 4,015 | 14,623 00 | 21,849 | .17653 | 64296 | 22,743 |
| 298 | 320 | 4,150 | 15,325 25 | 21,286 | .18830 | 69536 | 22,039 |
| 256 | 255 | 3,934 | 15,257 25 | 20,641 | .18342 | 71139 | 21,447 |

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TABLE K.

Showing Locations at Which New Lamps Were Installed During Year 1908.

BOROUGH OF MANHATTAN.

New York Edison Company—Electric Arc Lamps.

| Location. | No. |
|---|---|
| Avenue A, southeast corner of Eighty-sixth street | 1 |
| Amsterdam avenue, northwest corner of Seventieth street | 1 |
| Ann street, Broadway and William street | 3 |
| Broadway, between Fulton and Ann streets | 1 |
| Broadway, junction of Park row (twin 450-watt arcs) | 2 |
| Broadway, southwest corner Park place | 1 |
| Broadway, Sixtieth to One Hundred and Twenty-seventh street | 183 |
| Canal street, junction of East Broadway | 1 |
| Canal street, southwest corner of Rutgers place | 1 |
| Cedar street, Broadway to William street | 2 |
| Centre Market place, between Grand and Broome streets | 2 |
| Church street, between Liberty and Cortlandt streets | 1 |
| Church street, between Fulton and Dey streets | 2 |
| Cooper square, junction of Third and Fourth avenues | 1 |
| Delancey street, between Clinton and Essex streets | 9 |
| Dey street, West street to Greenwich street | 3 |
| East Twenty-fourth street, between First avenue and Avenue A | 1 |
| East Twenty-fourth street, southwest corner of Marginal | 1 |
| East Eighty-sixth street, between Avenue A and Henderson place | 1 |
| Eleventh avenue, northwest corner of Twenty-second street | 1 |
| Eleventh avenue, southeast corner of Twenty-third street | 1 |
| Greenwich avenue, southeast corner of Tenth street | 1 |
| Gold street, southeast corner of Ryders alley | 1 |
| Marion street, between Broome and Spring streets | 1 |
| Marginal street, between Thirteenth and Twenty-first streets | 9 |
| Morningside Park West, One Hundred and Tenth to One Hundred and Twenty-first street | 12 |
| Patchen place, northwest corner of Tenth street | 1 |
| Pine street, Broadway to William street | 2 |
| Queensboro Bridge approach | 2 |
| Riverside avenue, southeast corner of One Hundred and Twenty-ninth street | 1 |
| Riverside drive, Seventy-second to One Hundred and Tenth street | 33 |
| St. Nicholas avenue, One Hundred and Fifteenth to One Hundred and Seventeenth street | 3 |
| St. Nicholas avenue, One Hundred and Twenty-first to One Hundred and Twenty-second street | 3 |

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| Location. | No. |
|---|---|
| St. Nicholas terrace, One Hundred and Twenty-seventh to One Hundred and Thirty-fifth street | 9 |
| Second avenue, opposite One Hundred and Twenty-ninth street | 1 |
| Seventh avenue, between One Hundred and Tenth and One Hundred and Thirty-sixth streets | 25 |
| Seventh avenue, between One Hundred and Tenth and One Hundred and Thirty-Sixth streets (centre plots) | 24 |
| Seward Park (gymnasium) | 1 |
| Sixth avenue, southwest corner of Tenth street | 1 |
| Tenth avenue, southwest corner of Fourteenth street | 1 |
| Thames street, between Greenwich street and Trinity place | 1 |
| Trinity place, between Morris and Thames streets | 8 |
| Washington street, between Battery place and Morris street | 2 |
| Washington street, southeast corner of Albany street | 1 |
| Washington street, southeast corner of Cedar street | 1 |
| Washington street, southeast corner of Cortlandt street | 1 |
| West street, between Battery place and Morris street | 1 |
| West street, opposite Cortlandt street | 1 |
| West Twenty-third street plaza | 1 |
| West Thirty-first street, Eighth to Ninth avenue | 3 |
| West Thirty-second street, Fifth avenue and Broadway | 3 |
| West Thirty-third street, Sixth to Seventh avenue | 3 |
| West Thirty-third street, between Seventh and Eighth avenues | 2 |
| West Thirty-third street, Eighth to Ninth avenue | 3 |
| West Thirty-fourth street, Fifth and Sixth avenues | 1 |
| West Forty-second street, northeast corner of Depew place | 1 |
| West Forty-second street, northwest corner of Madison avenue | 1 |
| West Seventy-ninth street, Broadway to Marginal | 5 |
| West Ninety-sixth street, Broadway to railroad tracks | 5 |
| West One Hundred and Tenth street, Eighth to Columbus avenue | 3 |
| West One Hundred and Twenty-second street, Amsterdam to Claremont avenue | 6 |
| **Parks, etc.** | |
| Central Park entrance at One Hundred and Tenth street and Seventh avenue | 2 |
| St. Nicholas Park, path from east to west side | 1 |
| **Twin Arc Lamps (500-watt).** | |
| Fifth avenue, northeast corner of Thirty-fourth street | 1 |
| Total | 407 |

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United Electric Light and Power Company District.

| Location. | No. |
|---|---|
| Amsterdam avenue, One Hundred and Ninetieth street to St. Nicholas avenue.. | 12 |
| Audubon avenue, One Hundred and Ninetieth street to Fort George avenue..... | 6 |
| Madison Avenue Bridge (Manhattan approach)..... | 3 |
| Riverside drive, One Hundred and Twentieth street to Claremont avenue..... | 2 |
| Riverside drive, northeast corner of One Hundred and Forty-seventh street.... | 1 |
| Riverside drive extension, One Hundred and Thirty-fifth street to One Hundred and Forty-fifth street..... | 25 |
| Ship Canal Bridge (Southern approach)..... | 1 |
| Seventh avenue (centre plots), One Hundred and Thirty-sixth street to One Hundred and Fifty-third street..... | 17 |
| Seventh avenue, One Hundred and Thirty-seventh to One Hundred and Fifty-fourth street ..... | 17 |
| St. Nicholas terrace, One Hundred and Thirty-sixth to One Hundred and Thirty-seventh street ..... | 2 |
| University Heights Bridge..... | 7 |
| West One Hundred and Thirty-fifth street, between Amsterdam avenue and St. Nicholas terrace ..... | 4 |
| West One Hundred and Thirty-eighth street, Riverside drive and Broadway..... | 2 |
| West One Hundred and Fortieth street, Broadway to Riverside drive..... | 3 |
| West One Hundred and Forty-fifth street, between Broadway and Riverside drive. | 1 |
| West One Hundred and Forty-sixth street, between Lenox and Seventh avenues ..... | 2 |
| West One Hundred and Forty-eighth street, Broadway to Riverside drive..... | 2 |
| West One Hundred and Fifty-eighth street, Boulevard Lafayette to Harlem River. | 4 |
| West One Hundred and Eighty-first street, Boulevard Lafayette to Broadway.... | 8 |
| West One Hundred and Ninetieth street, Audubon to Amsterdam avenue..... | 1 |
| West Two Hundred and Seventh street, between Amsterdam and Ninth avenues. | 2 |
| West Two Hundred and Twenty-first street, southeast corner of Broadway.... | 1 |
| Total..... | 123 |

New York Edison Company, Electric Tungsten Incandescent Lamps.

| Location. | No. |
|---|---|
| Riverside drive, One Hundred and Fourth to One Hundred and Twentieth street. | 80 |
| Riverside Park, Seventy-second to One Hundred and Twentieth street..... | 173 |
| St. Nicholas Park..... | 49 |

United Electric Light and Power Company District.

| | |
|---|---|
| High Bridge Park..... | 17 |
| Riverside drive extension..... | 53 |

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Carbon Incandescent Lamps.

| Location. | No. |
|---|---|
| University Heights Bridge | 1 |
| Total | 373 |

Welsbach Street Lighting Company of America—Mantle Gas Lamps.

| Location. | No. |
|---|---|
| Amsterdam avenue, One Hundred and Thirty-eighth to One Hundred and Fortieth street | 4 |
| East One Hundred and Tenth street, Fifth avenue circle (fountain) | 1 |
| East Forty-ninth street, north side, east of Third avenue | 1 |
| Fort Washington avenue, northeast corner of One Hundred and Seventy-eighth street | 1 |
| Fort Washington avenue, northwest corner of One Hundred and Eightieth street. | 1 |
| Jumel place, One Hundred and Sixty-seventh street to Edgecombe avenue | 6 |
| Park row, junction Nassau street (Franklin statue) | 1 |
| Riverside drive, east side of One Hundred and Fourth street | 1 |
| Riverside drive, east side of One Hundred and Seventh to One Hundred and Ninth street | 2 |
| Riverside avenue, east side, north of Claremont place | 1 |
| Transverse road, No. 1 Lamps, 35 and 36 | 2 |
| St. Nicholas avenue, northwest corner of One Hundred and Sixth-fourth street.. | 1 |
| West Fifty-second street, Broadway to Seventh avenue | 1 |
| West One Hundred and Twenty-third street, Seventh and Eighth avenues | 1 |
| West One Hundred and Thirty-second street, south side, east of Twelfth avenue. | 1 |
| West One Hundred and Fifty-first street, Bradhurst to Eighth avenue | 2 |
| West One Hundred and Sixty-seventh street, Amsterdam to Edgecombe avenue. | 5 |
| West One Hundred and Seventieth street, Fort Washington avenue to Broadway. | 6 |
| West One Hundred and Seventy-seventh street, Broadway to Fort Washington avenue | 3 |
| West One Hundred and Eightieth street, south and north, east of Fort Washington avenue | 5 |
| Total | 46 |

Mantle Gas Lamps Installed in Front of Churches, etc.

| Location. | No. |
|---|---|
| East Seventh street, south side, east of Avenue C; church | 2 |
| East Thirty-second street, north side, east of Lexington avenue; church | 1 |
| East One Hundred and Fourteenth street, north side, east of First avenue; church. | 2 |
| East One Hundred and Seventeenth street, north side, east of Park avenue; church | 3 |

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| Location. | No. |
|---|---|
| East One Hundred and Thirty-second street, north side, east of Madison avenue; church | 1 |
| Fort Washington avenue, west side, north of One Hundred and Seventy-eighth street; church | 1 |
| Lexington avenue, north side, 2 north of One Hundredth street; church | 1 |
| Seventh avenue, northeast corner of Fifty-fourth street; church | 2 |
| East Third street, north side, east of Second avenue; synagogue | 2 |
| East Seventy-second street, south side, east of Second avenue; synagogue | 2 |
| East One Hundred and Eighteenth street, north side, east of Lexington avenue; synagogue | 1 |
| Lexington avenue, east side, north of One Hundred and Twenty-sixth street; hospital | 2 |
| West Forty-fifth street, south side, east of Eleventh avenue; school | 1 |
| East Ninth street, south side, 1 east of Union place; Police station | 1 |
| Broadway, southeast corner of Fifty-sixth street; fire alarm | 1 |
| West End avenue, southwest corner of Seventy-eighth street and southwest corner of Eighty-second street; fire alarm | 2 |
| Total | 25 |

TABLE L.

Showing Locations at Which New Lamps Were Installed During Year 1908.

BOROUGH OF THE BRONX.

New York Edison Company—Electric Arc Lamps.

| Location. | No. |
|---|---|
| Albany road, junction of Bailey avenue | 1 |
| Boston road, One Hundred and Seventy-seventh and One Hundred and Eighty-second streets | 7 |
| Burnside avenue, Aqueduct to Jerome avenue | 6 |
| Burnside avenue, Creston to Anthony avenue | 5 |
| Dongan street, Westchester avenue to Southern boulevard | 6 |
| Depot place, northwest corner of New York Central Bridge | 1 |
| East One Hundred and Forty-first street, Wales and Concord avenues | 1 |
| Fordham road, Harlem River terrace to Cedar avenue | 2 |
| Fulton avenue, southwest corner of One Hundred and Sixty-seventh street | 1 |
| Fulton avenue, One Hundred and Seventieth and One Hundred and Seventy-first streets | 4 |
| Hunts Point road, Southern boulevard to Lafayette avenue | 6 |
| Jerome avenue, northeast corner of One Hundred and Sixty-first street | 1 |
| Jerome avenue, junction of Macombs road | 1 |

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| Location. | No. |
|---|---|
| Jerome avenue, southeast corner of Belmont street | 1 |
| Jerome avenue, northeast corner of One Hundred and Eighty-first street | 1 |
| Jerome avenue, southwest corner of One Hundred and Eighty-third street | 1 |
| Jerome avenue, northwest corner of Fordham road | 1 |
| Kingsbridge road, west side, north of Two Hundred and Thirtieth street | 1 |
| Kingsbridge road, Concourse to Valentine avenue | 5 |
| Ogden avenue, Jerome avenue to One Hundred and Sixty-seventh street | 3 |
| Sheridan avenue, northeast corner of One Hundred and Sixty-first street | 1 |
| Southern boulevard, Hunts Point road to Aldus street | 2 |
| Third avenue, Lorillard place to Washington avenue | 4 |
| Tremont avenue, Bryant to Vyse avenue | 1 |
| Tremont avenue west of Park avenue | 1 |
| Tremont avenue, Creston to Anthony avenue | 4 |
| Tremont avenue, Monroe to Jerome avenue | 6 |
| University Heights Bridge (Bronx approach) | 7 |
| Washington avenue, west side, north of One Hundred and Eighty-first street | 1 |
| Webster avenue, One Hundred and Seventy-eighth and One Hundred and Seventy-ninth streets | 1 |
| Webster avenue, Fordham road to One Hundred and Ninety-third street | 2 |
| West One Hundred and Sixty-first street, east of Melrose avenue | 1 |
| West One Hundred and Sixty-seventh street, southeast corner of One Hundred and Sixty-eighth street | 1 |
| West One Hundred and Sixty-eighth street, south side, east of Ogden avenue | 1 |
| West One Hundred and Eighty-fourth street, Harlem River terrace to Fordham road | 4 |
| Total | 92 |

Electric 54-watt Tungsten Lamps Installed by New York Edison Company.

| Location. | No. |
|---|---|
| Anderson avenue, Jerome avenue to One Hundred and Sixty-fourth street | 6 |
| Crotona Park East, north of One Hundred and Seventy-third street | 3 |
| Devoe terrace, Webb avenue to One Hundred and Ninetieth street | 7 |
| East One Hundred and Eighty-first street, south side, east of Monterey | 1 |
| Heath avenue, Fort Independence street to Hub terrace | 3 |
| Manida street, north of Randall, to Lafayette avenue | 10 |
| North street, Davidson to Aqueduct avenue east | 3 |
| Summit place, Heath avenue to Boston road | 2 |
| Shakespeare avenue, Boscobel avenue to One Hundred and Seventy-second street | 8 |

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| Location. | No. |
|---|---|
| University Heights Bridge (Bronx approach) | 1 |
| West One Hundred and Eightieth street, Aqueduct avenue to Weygandt place | 2 |
| West One Hundred and Ninetieth street, Devoe terrace to Aqueduct | 1 |
| Weygandt place, One Hundred and Eightieth to One Hundred and Eighty-first street | 3 |
| Total | 50 |

Electric Arc Lamps Installed (Westchester Lighting Company District).

| Location. | No. |
|---|---|
| East Two Hundred and Thirty-third street, White Plains to Sixth avenue | 8 |
| King avenue (City Island) | 1 |
| Minneford avenue and Ditmars street (City Island) | 3 |
| Pelham Bay Bridge, over Eastchester Bay | 15 |
| Shore road, south of City line | 1 |
| Total | 28 |

Electric Arc Lamps Installed, Bronx Gas and Electric Company.

| Location. | No. |
|---|---|
| Castle Hill avenue, between Westchester and Railroad avenues | 2 |
| Castle Hill avenue, Parker to Glebe avenue | 3 |
| Classons Point road, between Westchester avenue and Classons Point | 7 |
| Country Club avenue, opposite John street | 1 |
| Eastchester road, northwest corner Syracuse avenue | 1 |
| Eastchester road, between Maple and Saratoga avenues | 1 |
| Fort Schuyler road, opposite Bolen Green | 1 |
| Fort Schuyler road and Latting street | 1 |
| Glebe avenue, northwest corner Starling avenue | 1 |
| Glover avenue, between Lyon and Westchester avenues | 1 |
| Main street, at railroad bridge | 1 |
| Middletown road, opposite Pier avenue | 1 |
| Olmstead avenue, northwest corner Watson avenue | 1 |
| Parker avenue, Castle Hill avenue to Stearns street | 1 |
| Unionport road, at New York, New Haven and Hartford Railroad bridge | 1 |
| Total | 24 |

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Electric 81-watt Tungsten Lamps Installed by Bronx Gas and Electric Company.

| Location. | No. |
|---|---|
| Baker avenue, between Garfield avenue and Unionport road | 4 |
| Balcolm avenue, north of Waterbury to north of Latting avenue | 5 |
| Bowne street, north side, east of Kirk street | 1 |
| Bronxdale road, at railroad bridge | 2 |
| Brown avenue, north of Sagamore street | 2 |
| Corsa lane, Fifth avenue to Boston road | 29 |
| Chatterton avenue, between Olmstead and Castle Hill avenues | 3 |
| Cruger avenue, Morris Park avenue to North Burnett place | 2 |
| Edwards avenue, Waterbury avenue north of Latting street | 7 |
| Ellison avenue, Waterbury avenue to 200 feet north | 2 |
| Elliott avenue, southeast corner B street | 1 |
| Haviland avenue, Pugsley avenue to Olmstead avenue | 3 |
| Herschell street, east side, south of Halsey place | 1 |
| Holland avenue, north of Burnett place | 2 |
| Latting street, Edwards to Balcolm street | 1 |
| Lyvere place, between Zerega and Walker avenues | 2 |
| Mathews street, east side, north of Morris Park avenue | 1 |
| Mulford avenue, James street to north of Alice avenue | 5 |
| Mulner avenue, west side, north of Morris Park avenue | 1 |
| Newbold avenue, between Olmstead and Pugsley avenues | 2 |
| Olmstead avenue, between Newbold and Walker | 1 |
| Saratoga avenue, from west of Narragansett drive | 3 |
| St. Lawrence avenue, north and south, Gleason avenue | 3 |
| Waterbury avenue, Havemeyer to Avenue A | 2 |
| Wellman avenue, Appleton to Mayflower street | 6 |
| Westchester avenue, St. Peter and Overing avenues | 1 |
| Total | 92 |

Mantle Gas Lamps Installed, Welsbach Street Lighting Company of America.

| Location. | No. |
|---|---|
| Bainbridge avenue, Rochambeau avenue to Woodlawn road | 4 |
| Bathgate avenue, east and west, north of One Hundred and Eighty-ninth street | 3 |
| Bopner place, Morris avenue, east | 3 |
| Boone street, east and west side, north of One Hundred and Seventy-first street | 2 |
| Briggs avenue, Kingsbridge road to One Hundred and Ninety-fourth street | 6 |
| Briggs avenue, north and south of One Hundred and Ninety-seventh street | 4 |
| Bryant avenue, north of One Hundred and Seventy-second street | 3 |

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| Location. | No. |
|---|---|
| Byron street, east side, 1 north of Two Hundred and Thirty-ninth street | 1 |
| Carter avenue, One Hundred and Seventy-fourth to One Hundred and Seventy-fifth street | 6 |
| Charlotte street, east and west side, north of Jennings street | 2 |
| Concord avenue, east side, north of St. Marys street | 1 |
| Concord avenue, One Hundred and Forty-fifth to One Hundred and Forty-ninth street | 9 |
| Crotona avenue, west side, 1 north of One Hundred and Eighty-second street | 1 |
| Cypress avenue, One Hundred and Thirty-seventh to One Hundred and Forty-first street | 7 |
| Daly avenue, between One Hundred and Seventy-sixth to One Hundred and Seventy-seventh street | 8 |
| Davidson avenue, north of Evelyn place | 1 |
| Eastburn avenue, One Hundred and Seventy-third street north of One Hundred and Seventy-fourth street | 6 |
| East One Hundred and Thirty-ninth street, north side, 1 east of Brook avenue | 1 |
| East One Hundred and Forty-fifth street, south side, 4 east of Willis avenue | 1 |
| East One Hundred and Sixty-ninth street, Washington and Third avenues | 1 |
| East One Hundred and Seventy-first street, Washington and Third avenues | 1 |
| East One Hundred and Seventy-fourth street, Clay and Anthony avenues (steps) | 4 |
| East One Hundred and Seventy-sixth street, Bryant to Boone street | 3 |
| East One Hundred and Eighty-second street, between Grote street and Crotona parkway | 14 |
| East One Hundred and Eighty-ninth street, Southern boulevard to Third avenue | 28 |
| East Two Hundred and Seventh street, Woodlawn road to Perry avenue | 6 |
| East Two Hundred and Fourteenth street, Barnes to Bronxwood street | 2 |
| Findlay avenue, One Hundred and Sixty-ninth to One Hundred and Seventieth street | 10 |
| Fulton avenue, east and west side, One Hundred and Seventy-first street to Wendover avenue | 2 |
| Garden street, Crotona to Prospect avenue | 2 |
| Garrison avenue, northwest corner of Faile steet | 1 |
| Garrison avenue, northwest corner of Irvine street | 1 |
| Garrison avenue, south side, 1 east of Irvine street | 1 |
| Garrison avenue, north side, east of Hunts Point road | 2 |
| Grand Boulevard and Concourse, intersection of Two Hundredth street | 2 |
| Grand avenue, west side, 1 north of North street | 1 |
| Grand avenue, south of One Hundred and Ninety-second street to Kingsbridge road | 8 |
| Grant avenue, east side, north of One Hundred and Sixty-fifth street | 2 |

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| Location. | No. |
|---|---|
| Grote street, between Belmont and Cambrelling avenues | 2 |
| Harrison avenue, west side, north of Tremont avenue | 1 |
| Irvine street, Seneca to Garrison | 4 |
| Kappock street, Johnson to Arlington street | 8 |
| Kelly street, Longwood to Dongan street | 12 |
| Lyman place, One Hundred and Sixty-ninth street, north | 3 |
| Minford place, south of One Hundred and Seventy-second to One Hundred and Seventy-third street | 10 |
| Nelson avenue, Featherbed lane, north of One Hundred and Seventy-fifth street. | 4 |
| Park avenue, southwest corner One Hundred and Seventy-fifth street | 1 |
| Park avenue, One Hundred and Seventy-fourth street and Ittner place | 1 |
| Perry avenue, east and west, north of Two Hundredth street | 4 |
| Ryer avenue, One Hundred and Eightieth to One Hundred and Eighty-third street | 11 |
| Simpson street, from Dongan street north | 4 |
| Third avenue, northwest corner One Hundred and Fifty-second street | 1 |
| Timpson place, southwest corner One Hundred and Forty-ninth street | 1 |
| Vyse avenue, Boston road to Tremont avenue | 4 |
| Washington avenue, west side, 1 north of One Hundred and Eighty-ninth street.. | 1 |
| West One Hundred and Sixty-third street, east of Ogden avenue | 2 |
| West One Hundred and Sixty-sixth street, Jerome to Anderson avenue (steps).. | 4 |
| West One Hundred and Sixty-seventh street, north side, east of Nelson avenue.. | 1 |
| West One Hundred and Sixty-eighth street (steps), Shakespeare to Boscobel avenue | 4 |
| West One Hundred and Seventy-fifth street, east of Nelson avenue | 2 |
| West One Hundred and Eighty-first street, Aqueduct to Davidson avenue | 11 |
| West One Hundred and Eighty-eighth street, Aqueduct avenue west | 4 |
| Whitlock avenue, east and west side, south of Lafayette avenue | 7 |
| Wieher Court, east of Washington avenue | 3 |
| Woodlawn road, Two Hundred and Seventh street to Van Cortlandt avenue | 4 |
| Total | 274 |

Mantle Gas Lamps Installed in Front of Churches, etc., Welsbach Street Lighting Company of America.

| Location. | No. |
|---|---|
| Aqueduct avenue, north of One Hundred and Eighty-first street; church | 2 |
| Clay avenue, west side, north of One Hundred and Seventy-fourth street; church | 1 |
| East One Hundred and Forty-fifth street, north side, east of Willis avenue; church | 2 |

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| Location. | No. |
|---|---|
| Morris avenue, west side, north of One Hundred and Sixty-fifth street; church.. | 2 |
| Tiffany street, north side, east of Simpson street; church..... | 2 |
| Tremont avenue, southeast corner Park avenue (fire alarm)..... | 1 |
| Tremont avenue, southwest corner Third avenue (fire alarm)..... | 1 |
| Total ..... | 11 |

Mantle Naphtha Lamps Installed, Welsbach Street Lighting Company of America.

| Location. | No. |
|---|---|
| Belmont street (steps), Clay and Topping avenue..... | 6 |
| East One Hundred and Sixty-fifth street (steps), Third avenue and Boston road.. | 2 |
| Grand Boulevard and Concourse, Two Hundred and Fifth street and Van Courtlandt avenue ..... | 5 |
| Grand Boulevard and Concourse, One Hundred and Sixty-second to One Hundred and Sixty-fourth street ..... | 10 |
| Perry avenue, Two Hundredth and Two Hundred and First streets..... | 4 |
| Spuyten Duyvil Railroad Station (steps), Palisade avenue..... | 2 |
| Tiebout avenue, Ford street (steps)..... | 1 |
| Total ..... | 30 |

Parks, etc.

| | |
|---|---|
| Bronx Park ..... | 5 |
| Total naphtha lamps installed in The Bronx..... | 35 |

TABLE M.

Showing Locations at Which New Lamps Were Installed During Year 1908.

BOROUGH OF BROOKLYN.

Edison Electric Illuminating Company—450-Watt Electric Arc Lamps.

| Location. | No. |
|---|---|
| Avenue U, southwest corner of Lake street..... | 1 |
| Avenue T, south side, east of East Seventeenth street..... | 1 |
| Broadway, Roebling street and Myrtle avenue..... | 17 |
| Coney Island avenue, southeast corner Avenue Y..... | 1 |
| Carroll street, Rogers and Nostrand avenues..... | 1 |
| East Fifteenth street, north of Emmers lane..... | 1 |
| East Ninety-fifth street, northwest corner Smiths lane..... | 1 |
| East Eighty-third street, south of Manhattan Beach Railroad..... | 1 |

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| Location. | No. |
|---|---|
| East Nineteenth street, southwest corner Avenues Q and R | 2 |
| East Tenth street, northwest corner Avenue M | 1 |
| Fulton street, southwest corner Clinton street | 1 |
| Flatbush avenue, opposite Livingston street | 1 |
| Flatbush avenue, between Lafayette avenue and Hanson place | 1 |
| Gravesend avenue, between Avenue J and Twenty-second avenue | 2 |
| Grand street extension, Bridge plaza to Grand street | 9 |
| Kings highway, southeast corner East Seventeenth street | 1 |
| Myrtle avenue, northwest corner Kent avenue | 1 |
| Morgan avenue, Anthony to Beadel street | 3 |
| Neck road, northeast corner East Twenty-first street | 1 |
| Neck road, northwest corner East Twenty-fourth street | 1 |
| Neck road, southeast corner East Fourteenth street | 1 |
| New Lots road, southwest corner New Jersey avenue | 1 |
| New Lots road, northeast corner Junius street | 1 |
| Ocean avenue, between Avenues K and M | 2 |
| Pitkin avenue, northeast corner Barrett street | 1 |
| Roebling street, South Fourth street and Union avenue | 10 |
| Sixth street, west of Second avenue | 1 |
| Sheepshead Bay road, between East Fifteenth and Sixteenth streets | 1 |
| Strykers court, north of McLaughlins Park | 1 |
| Sheepshead Bay road, north of Voorhees avenue | 1 |
| Sheepshead Bay road, north of Emmons avenue | 1 |
| Twenty-sixth avenue, northwest corner Cropsey avenue | 1 |
| Van Sicklen avenue, northwest corner Livonia avenue | 1 |
| Van Sicklen avenue, opposite Village road | 1 |
| Village road, Johnsons lane and Gravesend avenue | 2 |
| West Fourth street, southeast corner Avenue S | 1 |
| West Sixteenth street, southwest corner Neptune to Mermaid avenue | 2 |
| McLaughlin Park | 7 |
| Total | 84 |

325-Watt Electric Arc Lamps.

| Location. | No. |
|---|---|
| Fulton street and Boerum place, Hall of Records | 1 |
| Fulton street, Kings County Court House | 1 |
| Total | 2 |

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Flatbush Gas Company—Electric Arc Lamps.

| Location. | No. |
|---|---|
| Beverly road, southeast corner East Second street | 1 |
| Gravesend avenue, Avenue F and Franklin avenue | 1 |
| Hawthorne street, Brooklyn and Kingston avenues | 1 |
| Linden avenue, southeast corner Fifty-second street | 1 |
| Maple street, southwest corner Kingston avenue | 1 |
| Maple street, southwest corner Brooklyn avenue | 1 |
| Rutland road, southwest corner East Fifty-second street | 1 |
| Kingston avenue, Hospital grounds | 3 |
| Total | 10 |

Mantle Gas Lamps, New York and New Jersey Globe Gas Light Company (Brooklyn Union Gas Company District).

| Location. | No. |
|---|---|
| Albemarle road, east of East Sixteenth street | 2 |
| Avenue D, between Bedford and New York avenues | 12 |
| Beverly road, Prospect street to Lott street | 3 |
| Bradford street, Atlantic avenue and Fulton street | 1 |
| Carroll street, Rogers and Nostrand avenues | 7 |
| Caton avenue, northwest corner Ocean parkway | 1 |
| Centre street, between Clinton street and Hamilton avenue | 3 |
| Clarendon road, Nostrand avenue and East Thirty-seventh street | 12 |
| Cornelia street, Knickerbocker and Irving avenues | 5 |
| Crescent avenue, north of Sutter to Pitkin avenue | 5 |
| Crystal street, Glenmore and Liberty avenues | 2 |
| Dennett place, between Nelson and Luqueer streets | 1 |
| Denton place, north of First street | 2 |
| East Second street, between Avenue C and Beverly road | 5 |
| East Third street, west side, 1 south of Ditmas avenue | 1 |
| East Third street, Church avenue and Avenue A | 3 |
| East Fourth street, Caton avenue south | 3 |
| East Eighth street, Avenues B and C | 5 |
| East Tenth street, between Church and Caton avenues | 4 |
| East Eleventh street, between Church and Caton avenues | 2 |
| East Twenty-first street, south of Regent place | 1 |
| East Twenty-first street, between Avenues G and H | 3 |
| East Twenty-ninth street, northwest corner Avenue D to north of Avenue D | 2 |
| East Thirty-first street, south of Tilden street | 3 |

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| Location. | No. |
|---|---|
| East Thirty-second street, south of Canarsie lane | 2 |
| East Thirty-fourth street, northwest corner Avenue D to north of Avenue D | 2 |
| East Thirty-fourth street, north of Church avenue | 2 |
| East Thiry-eighth street, Avenues F and G | 2 |
| East Forty-eighth street, Avenue O to Avenue L | 13 |
| East Forty-ninth street, southeast corner Avenue M to north of Mill lane | 5 |
| Eastern parkway, Rogers and Nostrand avenues | 4 |
| Elton street, south of Liberty avenue | 1 |
| Etna street, Force Tube avenue to Enfield street | 10 |
| Evergreen place, Pellington place and New Jersey avenue | 2 |
| Fifty-ninth street, east of Sixth avenue | 2 |
| Flatlands avenue, Flatbush avenue and East Fortieth street | 3 |
| Forbell avenue, north of Broadway and southeast corner Magenta street | 2 |
| Foster avenue, East Twenty-fifth street and Rogers avenue | 3 |
| Fulton avenue, Lincoln and Grant avenues | 5 |
| Furman street, south and north of Joralemon street | 2 |
| Georgia avenue, Hegeman and New Lotts avenues | 6 |
| Gold street, Willoughby street and Myrtle avenue | 2 |
| Grant avenue, Fulton street and Ridgewood avenue | 3 |
| Grant avenue, Pitkin and Liberty avenues | 4 |
| Harman street, Wyckoff and St. Nicholas avenues | 2 |
| Hart street, Irving and Wyckoff avenues | 4 |
| Havemeyer street, South Ninth street and Division avenue | 1 |
| Hemlock street, Etna street and Jamaica avenue | 6 |
| Hendrix street, Dumont and Livonia avenues | 5 |
| Howard avenue, Dumont and Blake avenues | 5 |
| Irving avenue, Starr street and Melrose avenue | 5 |
| Junius street, Lott avenue north | 2 |
| Logan street, Blake and Sutter avenues | 4 |
| Lott avenue, northwest corner Powell street to northeast corner Junius street | 4 |
| Magenta street, east of Elderts lane | 1 |
| Martense street, Bedford and Rogers avenues | 5 |
| Montrose avenue, south side, 3 east of Manhattan avenue | 1 |
| Morgan avenue, Nassau and Norman avenues | 5 |
| Nelson street, between Court and Smith streets | 2 |
| New Jersey avenue, Hegeman and New Lotts avenue | 5 |
| New York avenue, Clarendon road and Canarsie road | 2 |
| Nichols avenue, Fulton and Jamaica avenues | 13 |
| Oakland place, Butler street and Tilden avenue | 4 |
| Ocean Parkway, northwest corner Washington avenue | 1 |

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| Location. | No. |
|---|---|
| Park place, Troy and Schnectady avenues | 5 |
| Park place, east of Hopkinson avenue | 1 |
| Powell street, north of Lott avenue to Dumont avenue | 16 |
| Prince street, north of Fleet street | 1 |
| Prospect place, Eastern parkway to East New York avenue | 2 |
| Putnam avenue, northeast and southwest corners Franklin street | 2 |
| Railroad avenue, Etna and Jamaica avenues | 7 |
| Ralph avenue, Fulton street and Atlantic avenue | 5 |
| Repose place, Schenck street to southwest corner Barbey street | 2 |
| Rodney street, north of Division avenue | 1 |
| Schenectady avenue, between Avenues M and O | 5 |
| Schenck avenue, Hegeman and New Lotts avenue | 5 |
| Sheridan avenue, north of Pitkin avenue | 1 |
| Snediker avenue, Dumont avenue and Livonia street | 5 |
| Sackman street, northwest corner Dean street | 1 |
| Starr street, Wyckoff and St. Nicholas avenues | 3 |
| Shepherd avenue, north of Liberty avenue | 1 |
| Stone avenue, Glenmore and New York avenues | 3 |
| Sunnyside court, north of Sunnyside avenue | 1 |
| Sunnyside avenue, Miller avenue west | 2 |
| Suydam street, Wyckoff and St. Nicholas avenues | 3 |
| Third street, east of Gowanus Canal | 1 |
| Thirty-eighth street, between Thirteenth and Fifteenth avenues | 8 |
| Union place, north side, west of Classon avenue | 1 |
| Van Buren street, east of Lewis avenue | 1 |
| Washington avenue, First street and Coney Island avenue | 1 |
| Washington avenue, Pacific street and Atlantic avenue | 1 |
| West Ninth street, Columbia and Hicks streets | 2 |
| Whitwell place, north of First street | 2 |
| Weirfield street, Knickerbocker and Irving avenues | 5 |

Mantle Gas Lamps Installed in Front of Churches, Etc.

| | |
|---|---|
| Adams street, Myrtle avenue and Johnson street; Police | 1 |
| Bedford avenue, east side of North First street; Police | 1 |
| Broadway, east of Driggs avenue; Police | 1 |
| Bushwick avenue, east side Scholes and Stagg streets; Police | 1 |
| Bushwick avenue, north of Halsey street; Church | 2 |
| Claremont avenue, southeast corner Flushing avenue; Police | 1 |
| Classon avenue, east side, north of Monroe street; Church | 2 |
| Dean street, Schenectady and Utica avenues; Church | 1 |

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| Location. | No. |
|---|---|
| DeKalb avenue, north side, east of Broadway; Church | 1 |
| Fourth avenue, north of Fifty-fourth street; Church | 1 |
| Fourth avenue, southwest corner Forty-third street; Police | 1 |
| Fourth avenue, west side south of Forty-second street; Church | 1 |
| Gates avenue, southwest corner Grand avenue; Fire Alarm | 1 |
| Georgia street, north of Livonia avenue; Church | 1 |
| Graham avenue, between Montrose and Johnson avenues; Church | 2 |
| Harman street, Wyckoff and St. Nicholas avenues; Church | 2 |
| Hicks street, southwest corner Joralemon street; Fire Alarm | 1 |
| Knickerbocker avenue, north of Ralph street; Church | 1 |
| Lee avenue, east side, north of Hooper street; Church | 1 |
| Lee avenue, southwest corner Clymer street; Police | 1 |
| Leonard street, north of Driggs avenue; Church | 2 |
| Lincoln road, south side, east of Nostrand avenue; Church | 2 |
| Montrose avenue, Manhattan and Graham avenues; Church | 2 |
| Sackman street, north of Sutter avenue; School | 1 |
| Sackman street, west side, south of Atlantic avenue; Church | 2 |
| State street, north side, east of Smith street; Police | 2 |
| Sterling place, south side, east of New York avenue; Church | 1 |
| Stuyvesant avenue, north of Hancock street; Church | 1 |
| Thatford street, west side, south of Blake street; Synagogue | 1 |
| Watkins street, Sutter and Belmont streets; Synagogue | 1 |
| Washington avenue, east of Ocean parkway; Church | 2 |
| Willoughby street, southeast corner Adams street; Fire Alarm | 1 |
| Total | 376 |

Mantle Gas Lamps, New York and New Jersey Globe Gas Light Company (Brooklyn Borough Gas Company District).

| Location. | No. |
|---|---|
| Avenue V, between Nineteenth and Twentieth streets | 1 |
| Avenue W, between Nineteenth and Twentieth streets | 1 |
| Avenue O, southeast corner Second street | 1 |
| Avenue P, southwest corner First street | 1 |
| Avenue T, East Twelfth to southeast corner East Thirteenth streets | 6 |
| Avenue G, East Fourteenth and Sixteenth streets | 2 |
| Avenue H, East Fourteenth to southeast corner East Fifteenth street | 2 |
| Avenue P, northwest corner West street | 1 |
| De Koven Court, between Subway and East Seventeenth street | 2 |
| East Nineteenth street, between Avenues T and northwest corner Avenue V | 7 |
| East Nineteenth street, between Avenue V and northwest corner Avenue W | 5 |

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| Location. | No. |
|---|---|
| East Fifteenth street, between Avenues I and J | 1 |
| East Second street, between Ryder avenue and Avenue N | 3 |
| East Tenth street, Avenue Q to Ryder avenue | 20 |
| East Ninth street, Avenue Q to Avenue P | 3 |
| East Ninth street, Ryder avenue and Avenue W | 2 |
| East Nineteenth street, north of Emmons avenue | 1 |
| East Seventeenth street, between Avenues N and P | 10 |
| East Tenth street, between Avenues M and L | 2 |
| East Sixteenth street, between Avenues U and V | 5 |
| East Seventeenth street, Avenue V to north of Neck Road | 5 |
| East Third street, north of Ryder avenue | 1 |
| Homecrest avenue, between Avenues S and T | 6 |
| Irvington Place, between Subway and East Seventeenth street | 2 |
| West Second street, north of Avenue Q to Sixty-fifth street | 6 |
| Waldorf Court, East Fourteenth and Seventeenth streets | 4 |
| Wellington Court, East Fourteenth and Seventeenth streets | 4 |
| Total | 104 |

Mantle Gas Lamps, Kings County Lighting Company.

| Location. | No. |
|---|---|
| Sixty-ninth street, south side, 1 east of Seventeenth avenue on private post | 1 |
| Seventieth street, south side, 1 east of Seventeenth avenue on private post | 1 |
| Seventy-first street, south side, 1 east of Seventeenth avenue on private post | 1 |
| Seventeenth avenue, northeast corner Seventy-second street on private post | 1 |
| Seventeenth avenue, southwest corner Seventy-second street on private post | 1 |
| Seventeenth avenue, northeast corner Seventy-third street on private post | 1 |
| Seventeenth avenue, southwest corner Seventy-third street or private post | 1 |
| Seventeenth avenue, northeast corner Seventy-fourth street on private post | 1 |
| Total | 8 |

TABLE N.

Showing Locations at Which New Lamps Were Installed During Year 1908.

BOROUGH OF QUEENS.

Electric 325-Watt Arc Lamps—New York and Queens Electric Light and Power Company.

Flushing, Bayside, College Point and Whitestone Districts.

| Location. | No. |
|---|---|
| Bell avenue, east side opposite Prince street | 1 |
| Fifth avenue, Eighteenth to Twentieth street | 1 |

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| Location. | No. |
|---|---|
| Thirteenth street, southeast corner Louisa street | 1 |
| Whitestone Road, southeast corner Long Island Railroad Crossing | 1 |
| Total | 4 |

Jamaica and Hollis Districts.

| Location. | No. |
|---|---|
| Broadway, opposite Irving Place | 1 |
| Broadway, Frost avenue to Lowell avenue | 5 |
| Beaver street, northwest corner Long Island Railroad | 1 |
| Dubroff avenue, southeast corner South street | 1 |
| Fulton street, Van Wyck to Carlton avenues | 6 |
| Fulton street, Dora street to Dunham avenue | 3 |
| Fulton street opposite Columbus avenue | 1 |
| Fulton street opposite Hillsdale avenue | 1 |
| Jamaica Turnpike, southeast corner Hiawatha avenue | 1 |
| Jamaica avenue, Vine to Fulton avenue | 10 |
| Jay street, southeast corner South street | 1 |
| Liberty avenue, corner Maure and Hulst avenues | 2 |
| South street, southeast corner Brown avenue | 1 |
| Total | 34 |

Long Island City.

| Location. | No. |
|---|---|
| Borden avenue, West and Front streets | 1 |
| Borden avenue Bridge over Dutch Kills Creek | 4 |
| Boulevard, southwest corner Temple avenue | 1 |
| Boulevard, opposite Wolcott avenue | 1 |
| Eleventh avenue, northeast corner Potter avenue | 1 |
| First avenue, southwest corner Jamaica avenue | 1 |
| First avenue, southeast corner Graham avenue and Webster to Washington avenue | 2 |
| Fourth street, east to Van Alst avenue | 1 |
| Grand avenue, northwest corner Welling street | 1 |
| Hopkins street, southwest corner Temple street | 1 |
| Jackson avenue, opposite South Washington Place | 1 |
| Laurel Hill avenue, southwest corner Long Island Railroad | 1 |
| Madden street, southwest corner Long Island Railroad | 1 |
| Newton avenue, Crescent street to Flushing avenue | 1 |
| Queensboro Bridge, under Approach | 2 |

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| Location. | No. |
|---|---|
| Radde street, corner Freeman avenue and corner Paynter avenue | 2 |
| Tenth avenue, east side, 1 north of Vandeventer avenue | 1 |
| Tenth avenue, southeast corner Wilson avenue and southeast corner Pierce avenue | 2 |
| Vernon avenue, Graham avenue to Sanford avenue | 1 |
| Webster avenue, southeast corner William street | 1 |
| Total | 27 |

Newtown, Corona, Metropolitan, Glendale and Woodside Districts.

| Location. | No. |
|---|---|
| Anderson avenue, northwest corner of Seventh street | 1 |
| Brenton avenue, northwest corner Long Island Railroad | 1 |
| Flushing avenue, Bowery Bay Road to Jackson avenue | 20 |
| Furman avenue, northwest corner Long Island Railroad | 1 |
| Grand avenue, Railroad avenue to Lake street | 4 |
| Jackson avenue, southeast corner Fifth street | 1 |
| Junction avenue, Flushing avenue to Bowery Bay Road | 8 |
| Junction avenue, southeast corner Poor, Bowery Road | 1 |
| Ludlow street, northeast corner Fourth street | 1 |
| Myrtle avenue, northeast corner Backus street | 1 |
| National avenue, Park to Grand avenue | 5 |
| Railroad avenue, corner Vine street, Mulberry avenue, Sycamore avenue and Central avenue | 4 |
| Trotting Course Lane, southwest corner Long Island Railroad (Rockaway Division) | 1 |
| Total | 49 |

Queens District.

| Location. | No. |
|---|---|
| Creed avenue, southeast corner Long Island Railroad Crossing | 1 |
| First avenue, southwest corner Long Island Railroad Crossing | 1 |
| Jericho Turnpike, northeast, Wertland and Franklin avenues | 2 |
| Total | 4 |

Richmond Hill District.

| Location. | No. |
|---|---|
| Broadway, southwest corner Briggs and Spruce avenues | 2 |
| Broadway, corner Curtis avenue, Sherman street and Morris avenue | 3 |

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| Location. | No. |
|---|---|
| Jamaica avenue, Beach and Willow avenues | 3 |
| Liberty avenue, Spruce to Wickes avenue | 3 |
| Liberty avenue, northeast corner Grant avenue | 1 |
| Myrtle avenue, northwest corner Chestnut street | 1 |
| Total | 13 |

Woodhaven District.

| Location. | No. |
|---|---|
| Atlantic avenue, southeast corner of Hoffman and Napier avenues | 2 |
| Atlantic avenue, northwest Napier and Ocean avenues | 2 |
| Atlantic avenue, east of Union and east of Wycoff avenues | 2 |
| Atlantic avenue, southeast corner Second street | 1 |
| Broadway, south side, east and west of Ferry street, corner Canal street and Morris avenue | 4 |
| Broadway, southwest corner Ocean and Lawn avenues | 2 |
| Broadway, east of Bengal street | 1 |
| Liberty avenue, Broadway to Woodhaven avenue | 9 |
| Rockaway Road, University Place to Atlantic avenue | 1 |
| Total | 24 |

Electric 54-Watt Tungsten Incandescent Lamps, New York and Queens Electric Light and Power Company.

Bayside District.

| Location. | No. |
|---|---|
| Bell avenue, Broadway to Stratton avenue | 1 |
| Bell avenue, Shore avenue to Willets Point road | 21 |
| Montauk avenue, Third street to Eighth street | 6 |
| Prince street, south side west of Bell avenue | 1 |
| Total | 29 |

College Point District.

| Location. | No. |
|---|---|
| College avenue, Avenue D to North boulevard | 3 |
| Fifteenth street, High street to Avenue C | 3 |
| North boulevard, Tenth to Thirteenth street | 5 |
| Tenth street, north of North boulevard | 2 |

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| Location. | No. |
|---|---|
| Thirteenth street, Avenue C to Avenue F | 6 |
| Van Wyck lane, Boulevard to Creek | 4 |
| West boulevard, First avenue to North boulevard | 3 |
| Total | 26 |

Corona District.

| Location. | No. |
|---|---|
| Benjamin street, Shell road to Prometcha avenue | 1 |
| Central avenue, southwest corner Oak street | 1 |
| Clinton avenue, Jackson to Smith avenue | 1 |
| Cambridge street, Washington street to Corona avenue | 1 |
| Evergreen street, Prometcha to Park avenue | 1 |
| Jefferson street, northeast corner and east side, 1 north of Jackson avenue | 2 |
| Nevins street, Rapelye to Corona avenue | 5 |
| Park avenue, Junction avenue to De Witt street | 10 |
| Prometcha avenue, southeast corner Sycamore avenue | 1 |
| Prometcha avenue, Junction avenue to National avenue | 7 |
| Railroad avenue, Mulberry street to Myrtle avenue | 11 |
| Railroad avenue, Gay avenue to Grand avenue | 7 |
| Randall street, Prometcha avenue to Jackson avenue | 6 |
| Shell Road, Jefferson street to Jackson avenue | 16 |
| Smith avenue, southwest corner John street to Benjamin street | 5 |
| Washington street, Park to Jackson avenue | 2 |
| Total | 77 |

Flushing District.

| Location. | No. |
|---|---|
| Bowne avenue, Laburnam and Queens avenues | 1 |
| Bradford avenue, Lawrence street to Jagger avenue | 9 |
| Burling avenue, Laburnam and Queens avenues | 1 |
| Cypress avenue, southeast corner Twenty-third and Twenty-fourth streets | 2 |
| Colden avenue, Holly street and Hillside avenue | 2 |
| Franconia avenue, southeast corner Twenty-third, Twenty-fourth, Twenty-fifth, Twenty-sixth streets | 4 |
| Grove street, south side, 1 and 2 east of Lawrence street | 2 |
| Hillside avenue, Colden avenue to Jamaica avenue | 1 |
| Kalmia street, Jamaica and Colden avenues | 1 |
| Larch street, Jamaica and Colden avenues | 1 |

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| Location. | No. |
|---|---|
| Monroe street, south side, 1 east of Jamaica avenue | 1 |
| Twenty-second street, Queens to Sanford avenue | 14 |
| Twenty-third street, Queens to Franconia avenue | 2 |
| Twenty-fourth street, Queens to Franconia avenue | 2 |
| Twenty-fifth street, Cypress to Sanford avenues | 1 |
| Twenty-sixth street, Franconia to Broadway | 3 |
| Union avenue, Laburnam to Forest avenue | 2 |
| Warren street, north side, opposite Hamilton place | 1 |
| Whitestone road, Broadway to Palace boulevard | 2 |
| Total | 52 |

Glendale District.

| Location. | No. |
|---|---|
| Cooper avenue, Fosdick avenue to Witte street | 7 |
| Fosdick avenue, Myrtle to Cooper avenue | 2 |
| Myrtle avenue, Broad street to Hooker street | 3 |
| Ridgewood avenue, Myrtle and Edsall avenues | 10 |
| Trotting Course lane, Nichols avenue to William street | 4 |
| Total | 26 |

Jamaica District.

| Location. | No. |
|---|---|
| Allen street, Lincoln avenue to Sylvester avenue | 4 |
| Atfield street, Liberty to Chichester avenue | 3 |
| Baltic street, Lincoln avenue to South street | 3 |
| Baker avenue, Blanco avenue to Garden street | 3 |
| Beaufort avenue, Morris to Van Wyck avenue | 7 |
| Beaver street, Rockaway road to Prospect street | 3 |
| Brown avenue, northwest corner Atlantic street | 1 |
| Campion avenue, Caryl street to Hanson place | 1 |
| Centre street, Washington street to Union Hill avenue | 2 |
| Convent Place, Prospect street to North street | 2 |
| Dakota avenue, Wyoming street to Liberty avenue | 1 |
| Dean street, Shore avenue to South street | 3 |
| Dubroff avenue, Atlantic street to South street | 2 |
| Farmers avenue, Allen to Carter street | 3 |
| Frost street, Liberty to Beaufort avenue | 3 |
| Garden street, Ward street to Baker avenue | 8 |

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| Location. | No. |
|---|---|
| Gould street, Metropolitan avenue to Newton road | 5 |
| Grand avenue, Highland avenue north | 4 |
| Hawtree Creek road, South Villa street to Van Dyck avenue | 9 |
| Henry street, Shore to Sylvester avenue | 2 |
| Hillside avenue, Willow to Gould street | 8 |
| Hulst street, Liberty to Beaufort avenue | 2 |
| Jeffrey avenue, east side, 1 north of Rowland street and 1 north of Mitchell avenue | 2 |
| Kaplan avenue, west side, 1 north of Fulton street to west side, 1 north of Hammond place | 2 |
| Lefferts avenue, Hoffman Boulevard east | 5 |
| Liberty avenue, northeast corner Remington avenue | 1 |
| Liberty avenue, Baltic street to Longfellow avenue | 2 |
| Lincoln avenue, Henry street to Rockaway road | 2 |
| Linwood street, Washington avenue to Monroe street | 1 |
| Maure avenue, Van Sicklen to Liberty avenue | 6 |
| Maure avenue, Beaufort, north of Atlantic avenue | 3 |
| McAuley avenue, northeast corner, east side, 1 south and east side, 1 north of Hanson place | 3 |
| Minnesota street, Wyoming street to Liberty avenue | 1 |
| Mitchell avenue, south side, 1 west of Jeffrey avenue | |
| Newtown Road, Wickes street to Hillside avenue | 7 |
| Pierson avenue, Jeffrey to Kaplan avenue | 1 |
| Puntine street, Long Island Railroad to Fulton street | 3 |
| Ray street from Fulton street to Willard avenue | 12 |
| Rockaway road, Shore to Sylvester avenue | 2 |
| Rose avenue, Hanson Place to Fulton street | 1 |
| Shelton avenue, northwest corner Orchard street | 1 |
| Sherman street, Jamaica avenue to Newtown road | 4 |
| South street, George to Theodore street | 4 |
| Union Hall street, Cumberland to Centre street | 16 |
| Vanderbilt avenue, Caryl to Fulton street | 1 |
| Van Sicklen avenue, Hawtree Creek road to Liberty avenue | 5 |
| Ward street, Hill street to Newtown road | 1 |
| Washington avenue, Stewart to Jamaica avenue | 4 |
| Washington avenue, northwest corner Atlantic avenue | 1 |
| Washington street, South street to Long Island Railroad | 8 |
| West street, Bandmann to Liberty avenue | 2 |
| Wickes street, Metropolitan avenue to Newtown road | 4 |
| Willett avenue, from Kenilworth place to Burdett place | 2 |
| Wilton avenue, 500 feet east of Hoffman boulevard | 1 |

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| Location. | No. |
|---|---|
| Wyckoff avenue, Shore to Sylvester avenue | 2 |
| Wyoming street, southeast corner Nebraska street | 1 |
| Green street, Jamaica avenue to Newtown road | 3 |
| Total | 194 |

Laurel Hill District.

| Location. | No. |
|---|---|
| Newtown avenue, Shell road to Maurice avenue | 36 |
| Townsend avenue, Montgomery to Clifton avenue | 2 |
| Total | 38 |

Long Island City District.

| Location. | No. |
|---|---|
| Academy street, Elm to Grand street | 2 |
| Academy street, Graham street to Broadway | 2 |
| Boulevard, southwest corner and west side 1 north of Webster avenue | 2 |
| Boulevard, corner Thirteenth and Fourteenth streets | 2 |
| Bowery Bay road, Jackson to Flushing avenue | 21 |
| Buckley street, Skillman to Thompson avenue | 4 |
| Buchanan place, Grand to Newtown avenue | 1 |
| Crescent street, southwest corner Webster avenue | 1 |
| Crescent street, opposite Camelia street | 1 |
| Crescent street, Wilbur to Payntar avenue | 2 |
| Clark street, Van Alst avenue to Main street | 1 |
| Eighth street, East river to Vernon avenue | 4 |
| Eighth street, Webster to Washington avenue | 3 |
| Eighth street, Graham avenue to Broadway | 3 |
| Eighth street, Vandeventer to Flushing avenue | 4 |
| Eleventh avenue, southeast corner Wilson avenue | 1 |
| First avenue, Washington to Graham avenue | 2 |
| Fifth avenue, Freeman to Pierce avenue | 3 |
| Fourteenth avenue, Broadway to Newtown road | 3 |
| Flushing avenue, opposite Isabella place | 1 |
| Frankfort street, southeast corner Eleventh avenue | 1 |
| Franklin street, Boulevard to Stevens street | 1 |
| Hamilton street, Washington to Pierce avenue | 1 |
| Hamilton street, southeast corner Webster avenue | 1 |

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| Location. | No. |
|---|---|
| Hancock street, southeast corner Nott avenue | 1 |
| Henry street (north), Newtown road to Flushing avenue | 2 |
| Hulst street, northwest corner Foster avenue | 1 |
| Isabella place, Flushing avenue to Newtown road | 2 |
| Jackson avenue, opposite Beebe street | 1 |
| Laurel Hill avenue, Skillman avenue to Long Island Railroad | 5 |
| Locust street, Foster avenue to Skillman avenue | 1 |
| Main street, south side east of Grand avenue | 1 |
| Madden street, Long Island Railroad to Jackson avenue | 1 |
| Monson street, Fulton to Franklin street | 2 |
| Ninth avenue, Vandeventer to Flushing avenue | 3 |
| Ninth avenue, Jackson to Grand avenue | 11 |
| Ninth avenue, southwest corner Woolsey avenue | 1 |
| North Washington place, Van Alst avenue to Willow street | 2 |
| Pearson street, Jackson avenue to Long Island Railroad | 2 |
| Prospect street, Wilbur and Payntar avenues, and southwest corner Webster avenue | 2 |
| Radde street, Payntar to Freeman avenue | 3 |
| Sanford street, northwest corner Hancock street | 1 |
| Sherman street, southwest corner Elm street | 1 |
| Sherman street, southeast corner and east side 1 north of Pierce avenue | 2 |
| Sixth avenue, Graham avenue to Broadway | 2 |
| Sixth avenue, Vandeventer to Flushing avenue | 3 |
| Skillman avenue, Madden street to Grove street | 4 |
| Skillman avenue, southeast corner Harold and southeast corner Bragaw streets | 2 |
| Seventh avenue, Webster to Washington avenue | 1 |
| Seventh avenue, Graham avenue to Broadway | 2 |
| Seventh avenue, Grand to Flushing avenue | 6 |
| Temple street, Boulevard to Sherman street | 1 |
| Tenth street, Vermont and West avenues | 1 |
| Twelfth street, Vernon and East avenues | 1 |
| Van Alst avenue, Eleventh to Twelfth street | 3 |
| William street, northwest corner Henry street and southwest corner Beebe street | 2 |
| Willow street, west side, opposite north Washington place | 1 |
| Wolcott avenue, Ninth avenue to Barclay street | 15 |
| Woolsey street, between Main and Franklin streets | 1 |
| Total | 157 |

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Maspeth District.

| Location. | No. |
|---|---|
| Fiske avenue, northwest corner Elm street | 1 |
| Maspeth avenue, Van Cott avenue to Melvina place | 3 |
| Maiden lane, Johnson to Fulton avenue | 2 |
| New street, east of Maiden lane | 1 |
| Van Cott avenue, Grand avenue to Maspeth avenue | 6 |
| Weston avenue, Johnson avenue north | 4 |
| Total | 17 |

Metropolitan District.

| Location. | No. |
|---|---|
| Andrews street, Pacific street to Mt. Olivet avenue | 2 |
| Collins avenue, Metropolitan to Mt. Olivet avenue | 10 |
| Mt. Olivet avenue, Flushing avenue north of Metropolitan avenue | 16 |
| Troutman avenue, Onderdonk and Woodward avenues | 1 |
| Woodward avenue, Stockholm to Flushing avenue | 10 |
| Total | 39 |

Middle Village District.

| Location. | No. |
|---|---|
| Cooper avenue, Long Island Railroad to Trotting Course lane | 17 |
| Dry Harbor road, Trotting Course lane to Juniper Swamp road | 14 |
| Johnson avenue, Maiden lane to Dry Harbor road | 18 |
| Juniper avenue, North Hempstead road to Johnson avenue | 24 |
| Oak street, east of Juniper avenue | 1 |
| North Hempstead road (Juniper Swamp road), Juniper avenue to Dry Harbor road | 20 |
| Pine street, east of Juniper avenue | 1 |
| Van Dine street, Long Island Railroad to Cooper avenue | 5 |
| Total | 100 |

Newtown District.

| Location. | No. |
|---|---|
| Bowne street, Washington street to Trotting Course lane | 1 |
| Caldwell avenue, Grand street to Grandview avenue | 15 |
| Celtic avenue, Greenpoint to Middleburg avenue | 9 |
| Franklin avenue, Fisk to Madison avenue | 2 |
| Greenpoint avenue, Celtic to Hancock avenue | 3 |

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| Location. | No. |
|---|---|
| Grove street, opposite Medina place | 1 |
| Hogan place, Maurice avenue to William street | 3 |
| Jansen avenue, west of Madison avenue, west of Washington street | 7 |
| Madison avenue, Jansen to Bowne avenue | 1 |
| Madison avenue, Bryant street south | 3 |
| Middleburgh avenue, Celtic to Woodside avenue | 2 |
| North Hempstead road, east of Hoffman boulevard | 16 |
| Plain street, Washington to Adams street | 1 |
| Remsen avenue, Madison avenue to Trotting Course lane | 7 |
| Sixth street, Whitney to Lamont avenue | 1 |
| Trainsmeadow road, Baxter avenue to Astoria road | 24 |
| Trotting Course lane, Metropolitan avenue to Hoffman boulevard | 32 |
| Trotting Course lane, opposite Bowne street | 1 |
| Washington street, Jansen avenue to Bowne street | 3 |
| Whitney avenue, Third to Eighth street | 6 |
| Grandview avenue, Caldwell avenue to Grand street | 5 |
| Total | 143 |

Richmond Hill District.

| Location. | No. |
|---|---|
| Atlantic avenue, southwest corner Vine and southwest corner Curtis streets | 2 |
| Curtis street, Liberty to Belmont avenue | 1 |
| Jamaica avenue, opposite Green street and east of Troy street | 2 |
| Lefferts avenue, Liberty to Belmont avenue | 2 |
| Liberty avenue, Myrtle to Jefferson avenue | 5 |
| Sherman street, Belmont avenue to Broadway | 1 |
| Spruce street, Liberty to Belmont avenue | 1 |
| Vine street, Liberty to Belmont avenue | 1 |
| Total | 15 |

Electric 54-Watt Tungsten Incandescent Lamps.

Springfield District.

| Location. | No. |
|---|---|
| Foster's Meadow road, from Merrick road to Lamp C-1074 | 1 |
| Landing road, south of Rockaway road | 11 |
| Ocean avenue, Merrick road to Long Island Railroad | 10 |
| Total | 22 |

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Woodhaven District.

| Location. | No. |
|---|---|
| Atlantic avenue, Vandeveer place to Union avenue | 4 |
| Atlantic avenue, southeast corner of First street | 1 |
| Benedict street, Fulton to Jamaica avenue | 7 |
| Broadway, Emerald to Spruce street | 3 |
| Canal street, University place to Atlantic avenue | 1 |
| Drew avenue, Grand street to Sixth street | 2 |
| Emerald street, Broadway north | 1 |
| Ferry street, north of Jamaica avenue | 1 |
| Grafton avenue, Fourth street to Park place | 3 |
| Graves place, Elderts lane to Court street | 1 |
| Johnson avenue, Rockaway road to Sixth street | 2 |
| Jamaica avenue, Woodhaven to Manor avenue | 1 |
| Jamaica avenue, northwest corner of Willard avenue | 1 |
| Lawn avenue, west side, one north of Belmont avenue | 1 |
| Liberty avenue, Lawn to Napier avenue | 5 |
| Fulton street, southwest corner of Ferry street | 1 |
| Fulton street, Woodhaven to Napier avenue | 4 |
| Napier avenue, Atlantic avenue to Elm place | 3 |
| Poplar street, Napier avenue east | 2 |
| Rockaway road, Canal to Morris street | 4 |
| Rockaway road, Elderts lane to Drew avenue | 1 |
| Rockaway road, Grafton avenue to Ferry street | 1 |
| Shaw avenue, southeast corner of Fifth street | 1 |
| South street, Wyckoff to Washington avenue | 1 |
| University place, opposite McCormick and opposite Clinton streets | 2 |
| University place, Park street to Bigelow avenue | 7 |
| Water street, Spruce to Ferry street | 3 |
| Woodhaven avenue, northwest corner of Ashland avenue | 1 |
| Wyckoff avenue, South street to Grafton avenue | 3 |
| Forest parkway, west side, north of Howard to north of Simpson street | 10 |
| Total | 78 |

Woodside District.

| Location. | No. |
|---|---|
| Fifth street, Riker to Jackson avenue | 2 |
| Fourth avenue, southeast corner of Jackson avenue | 1 |
| Howell avenue, Woodside avenue to Fifth street | 5 |
| Seventh street, Jackson avenue to north of Charlotte avenue | 5 |

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| Location. | No. |
|---|---|
| Sixth street, Jackson to Charlotte avenue | 3 |
| Thompson avenue, northwest corner of Lincoln street | 1 |
| Total | 17 |

Electric 81-Watt Tungsten Incandescent Lamps.

College Point District.

| Location. | No. |
|---|---|
| College avenue, northeast corner of Avenue C | 1 |
| Fifth avenue, Fourteenth to Fifteenth street | 3 |
| Louisa street, Fourteenth to Fifteenth street | 3 |
| Sixth avenue, northeast corner of Fourteenth and Sixteenth streets | 2 |
| Thirteenth street, northeast corner of First avenue | 1 |
| Total | 10 |

Corona District.

| Location. | No. |
|---|---|
| Linden street, Park to Lake street | 1 |

Flushing District.

| Location. | No. |
|---|---|
| Boerum avenue, northeast corner of Barclay street | 1 |
| Broadway, south side, 1 and 2 east of Twenty-second street | 2 |
| Cypress avenue, southwest corner of Twenty-sixth street and southeast corner of Twenty-fifth street | 2 |
| Jamaica road, north and south of Quarrelsome lane | 3 |
| Twenty-first street, Laburnam to Queens avenue | 3 |
| Total | 11 |

Hollis District.

| Location. | No. |
|---|---|
| Bryan avenue, Beasley street to Debevoise avenue | 5 |
| Carpenter avenue, Sagamore avenue to east of Pocahontas avenue | 3 |
| Carpenter avenue, Jamaica turnpike to Chicopee avenue | 4 |
| Cherokee avenue, Jamaica turnpike to Choctaw avenue | 5 |
| Chicopee avenue, Woodhull to Cherokee avenue | 1 |
| Choctaw avenue, Cherokee to Carpenter avenue | 4 |

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| Location. | No. |
|---|---|
| Clio avenue, Dunton to Como avenue | 4 |
| Cornwell avenue, Long Island Railroad to Jamaica turnpike | 3 |
| Dunton avenue, east, Sutro street, to Dunton avenue west | 8 |
| Dunton avenue, west, Clio avenue, to Dunton avenue east | 2 |
| Farmers avenue, northeast corner of Long Island Railroad tracks, and west side, 1 south of tracks | 2 |
| Farmers avenue, north side, 1 east of Fulton avenue | 1 |
| Farmers avenue, Bryan avenue to Long Island Railroad | 4 |
| Flushing avenue, northwest corner of Belleview avenue, and northeast corner of Prospect avenue | 2 |
| Flushing avenue, southwest corner of Park avenue | 1 |
| Hollis avenue, Jamaica turnpike to Belleview avenue | 4 |
| Husson avenue, Jamaica turnpike to Hillside avenue | 7 |
| Jamaica turnpike, Carpenter to Woodhull avenue | 1 |
| Jamaica turnpike, halfway between Husson and Flushing avenues | 1 |
| Jamaica turnpike, Seminole to Minnetonka avenue | 1 |
| Keno avenue, northeast corner of Marango avenue | 1 |
| Maple avenue, northwest corner of Charles and Debevoise avenues | 2 |
| McLaughlin boulevard, Sancho to Marango avenue | 2 |
| McLaughlin boulevard, southeast corner of Flushing avenue | 1 |
| Minnetonka avenue, Woodhull avenue to Jamaica turnpike | 2 |
| Palo Alto avenue, Palermo avenue to Nero place | 4 |
| Palatina avenue, Jamaica turnpike to Bellevue avenue | 3 |
| Palermo avenue, opposite Palatina avenue | 1 |
| Palermo avenue, east of Palo Alto avenue | 1 |
| Pinto avenue, opposite Como avenue | 1 |
| Pueblo avenue, Flushing avenue to McLaughlin boulevard | 5 |
| Sagamore avenue, Cornwell to Carpenter avenue | 6 |
| Santiago avenue, Soho place to Nero place | 2 |
| Villard avenue, northeast corner of Prospect and Bellevue avenues | 2 |
| Warren street, Woodhull to Cherokee avenue | 1 |
| Woodhull avenue, Jamaica turnpike to Hiawatha avenue | 13 |
| Woodhull avenue, Warren street to Cherokee avenue | 3 |
| Total | 113 |

Jamaica District.

| Location. | No. |
|---|---|
| Allen street, South street to Bandman street | 3 |
| Alsop street, Fulton to Hillside streets | 5 |

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| Location. | No. |
|---|---|
| Atlantic street, northwest corner of Phramer avenue | 1 |
| Baltic street, southwest corner of Bandman avenue | 1 |
| Beaufort street, Irving place to Schooley street | 8 |
| Brenton avenue, South to Douglas street | 2 |
| Campion avenue, northeast corner of Caryl street and northeast corner of Hanson place | 2 |
| Canal street, Park place to Fulton street | 6 |
| Carlton avenue, Fulton to Shelton avenue | 3 |
| Chichester avenue, Guilford avenue to Tyndall street | 3 |
| Chichester avenue, Van Wyck avenue to Longfellow street | 5 |
| Clinton avenue, Fulton to Shelton avenue | 1 |
| Columbus avenue, Fulton street to Bellevue avenue | 6 |
| Dewey avenue, Samuel to Adolph street | 4 |
| Dora street, Fulton to Willow street | 2 |
| Douglas street, Brenton avenue to Larch street | 4 |
| Dunham avenue, Willow to Fulton street | 2 |
| Eastwood place, corner of St. Albans place | 1 |
| Fleet street, opposite Twombly place | 1 |
| Foley avenue, northwest corner of Hanson place | 1 |
| Flushing avenue, west side, opposite Highland avenue | 1 |
| Franklin street, Willow to Fulton street | 2 |
| Fulton street, south side, one east of Charles street | 1 |
| Fulton street, southeast corner of Cooper avenue | 1 |
| Grove street, opposite Myrtle avenue | 1 |
| Hanson place, McAuley avenue to Rose street | 2 |
| Harriman avenue, Fulton street to Shelton avenue | 4 |
| Hardenbrook avenue, Fulton street to Hillside avenue | 3 |
| Harvard avenue, Fulton street to Larremore avenue | 2 |
| Highland avenue, Flushing to Bergen avenue | 11 |
| Highview avenue, Cumberland to South street | 6 |
| Hoffman boulevard, north of Fulton street | 1 |
| Irving place, Broadway to Beaufort street | 1 |
| Jay street, northeast corner of Bandman avenue | 1 |
| Jeffrey avenue, north of Hillside avenue, opposite Mitchell avenue and southeast corner of Pierson avenue | 3 |
| Johnson avenue, Guilford street to east of Tyndall street | 4 |
| Kaplan avenue, Amherst to Pierson avenue | 3 |
| Kaplan avenue, northwest corner of Shelton and Horton streets | 2 |
| King street, Madison to Warwick avenue | 1 |
| Kissam place, northeast corner of Archer place | 1 |

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| Location. | No. |
|---|---|
| Liberty avenue, Frost to Dakota avenue | 4 |
| Madison avenue, St. Albans place to Hillside avenue | 4 |
| McAuley avenue, northwest corner and east side, 1 north of Caryl street, and east side, 2-3 north of Hanson place | 4 |
| Mitchell avenue, south side, 2 west of Jeffrey avenue | 1 |
| Myrtle avenue, Grove to Willett avenue | 4 |
| Norris avenue, Cumberland to South street | 5 |
| Parkview avenue, Park avenue to Crescent place | 2 |
| Prospect street, Pacific to Cumberland street | 5 |
| Rockaway road, South street to Guinsburg place | 4 |
| Shelton avenue, Flushing to Bergen avenue | 6 |
| Shelton avenue, Myrtle to Alsop street | 1 |
| Shelton avenue, northeast corner of Burdett place | 1 |
| Sherman street, west side, north of Stewart avenue | 1 |
| South street, between William and Samuel streets | 1 |
| South street, southeast corner of Jacob place | 1 |
| South street, northwest corner of Church street | 1 |
| Union avenue, west side, 1 and 2 north of Fulton street | 2 |
| Union Hall street, northwest corner, Centre street | 1 |
| Van Wyck avenue, Hawtree Creek road to Wyoming avenue | 3 |
| Van Wyck avenue, northeast corner of Caryl street | 1 |
| Vanderbilt avenue, northwest corner of Caryl street | 1 |
| Warwick avenue, Canonbury road to King street | 2 |
| Wheeler street, northwest corner of Willow street | 1 |
| Willett street, Myrtle avenue to Kenilworth place | 2 |
| Willow avenue, Canal to Dora street | 5 |
| Williamsburg road, Cottage avenue to Jamaica turnpike | 5 |
| Wilton avenue, south side, 1 and 3 east of Hoffman boulevard | 2 |
| Wyckoff avenue, South street to Bandman avenue | 3 |
| Yale avenue, Fulton street to Hillside avenue | 6 |
| Total | 191 |

Long Island City District.

| Location. | No. |
|---|---|
| Temple street, Van Alst to Hopkins avenue | 2 |

Metropolitan District.

| Location. | No. |
|---|---|
| Woodward avenue, Flushing to Metropolitan avenue | 2 |

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Queens District.

| Location. | No. |
|---|---|
| Carey street, Westland to Creed avenue | 2 |
| Clinton avenue, Bergen street to Jamaica turnpike | 2 |
| Creed avenue, east side, opposite Carey street | 1 |
| Fifth avenue, Amos street to Queens boulevard | 5 |
| First avenue, Hollis avenue to Long Island Railroad | 6 |
| Fourth avenue, Amos street to Queens boulevard | 6 |
| Franklin avenue, Whittier to St. Joseph avenue | 5 |
| Irving avenue, Wertland avenue to Williams place | 4 |
| Jericho turnpike, northwest corner of Hendrickson street | 1 |
| Jericho turnpike, Jericho turnpike to Ostend avenue | 4 |
| Jackson avenue, Everett place to Poplar street | 5 |
| Jefferson avenue, Jericho turnpike to Pine street | 3 |
| Joseph avenue, Franklin to Clinton avenue | 1 |
| Madison avenue, Jericho turnpike to Hickory street | 4 |
| Pleasant street, east side, 1 north of Poplar street | 1 |
| Queens road (Vogal avenue), Jamaica turnpike to Bergen avenue | 2 |
| Sigourney avenue, Wertland to Creed avenue | 2 |
| Sedgwick street, Wertland to Creed avenue | 2 |
| Second avenue, southeast corner of Queens boulevard | 1 |
| Springfield avenue (Rocky Hill road), Orange to Cherry street | 7 |
| Sherwood avenue, Amos to Seymour street | 4 |
| Wertland avenue, Sigourney avenue to Long Island Railroad | 5 |
| Wertland avenue, Jericho turnpike to Wood avenue | 10 |
| Whittier avenue, Jamaica turnpike to Creed avenue | 7 |
| Total | 90 |

Richmond Hill District.

| Location. | No. |
|---|---|
| Jamaica avenue, south side, 1 east of Sherman street | 1 |
| Liberty avenue, Vine street to Morris avenue | 4 |
| Total | 5 |

Woodhaven District.

| Location. | No. |
|---|---|
| Bigelow place, University place to Atlantic avenue | 1 |
| Jamaica avenue, Park street to Union avenue | 1 |

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| Location. | No. |
|---|---|
| South street, Ocean to Union avenue | 1 |
| Woodhaven avenue, northeast corner of Belmont avenue, and east side, 1 south of Atlantic avenue | 2 |
| Total | 5 |

Queens Borough Gas and Electric Company—325-Watt Electric Arc Lamps.

Arverne and Rockaway Districts.

| Location. | No. |
|---|---|
| Academy street, southwest corner of Long Island Railroad | 1 |
| Atlantic avenue, northeast corner of Long Island Railroad crossing | 1 |
| Bayswater avenue, northeast corner The Strand | 1 |
| Boulevard, northwest corner of Vernam avenue | 1 |
| Crescent street, Hamilton to Virgina place | 1 |
| Mott avenue, west of Summit drive and northeast of Bay street | 2 |
| Oak street, east side, north of Broadway | 1 |
| Remsen avenue, Sheridan boulevard to McNeil avenue | 8 |
| Sheridan boulevard, southeast corner of Horton place | 1 |
| Waterview avenue, Cornell to Bayswater avenue | 2 |
| Westbourne boulevard, southeast corner of Kensington Gardens | 1 |
| Westbourne boulevard, First place to The Strand (centre plot) | 1 |
| Total | 21 |

Electric Incandescent Lamps.

| Location. | No. |
|---|---|
| Wavecrest (Bay avenue) | 5 |

New York and New Jersey Globe Gas Light Company—Mantle Gas Lamps.

Bay Side District.

| Location. | No. |
|---|---|
| Bell avenue, Broadway to Lawrence boulevard | 1 |
| Bradish avenue, southeast corner Florence avenue | 1 |
| North First street, Lawrence boulevard to Park avenue | 2 |
| Total | 4 |

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College Point District.

| Location. | No. |
|---|---|
| Fifth avenue, Fifteenth to Sixteenth streets | 1 |
| Fifteenth street, Fifth to Sixth avenues | 2 |
| Fourteenth street, Louisa street to Fifth avenue | 1 |
| Total | 4 |

Flushing District.

| Location. | No. |
|---|---|
| Linden avenue, Myrtle to Bayside avenues | 2 |
| Twelfth street, Myrtle avenue north | 2 |
| Total | 4 |

Newtown District.

| Location. | No. |
|---|---|
| Backus street, Cooper to Myrtle avenues | 1 |
| Bleecker street, Cypress to Covert avenues | 3 |
| Bleecker street, east side, 1 north of Onderdonk avenue | 1 |
| Broad street, north of Maspeth avenue | 3 |
| Church street, west side, 1 north of Metropolitan avenue | 1 |
| Cleveland street, east and west, 2 north of Jackson avenue | 2 |
| Clifton avenue, west side, 1 north of President place | 1 |
| Clifton avenue, east side, 1 north of Prospect place | 1 |
| Cornelia street, north side, 1 east of Covert avenue | 1 |
| Cook avenue, Chicago to Toledo avenues | 5 |
| Cooper avenue, Harmon to Yale avenues | 3 |
| Cornelia street, Wyckoff to St. Nicholas avenues | 2 |
| Crown street, Myrtle avenue to west of Central avenue | 9 |
| De Witt street, Smith to Flushing avenues | 4 |
| De Witt street, Shell Road to Prometcha avenue | 3 |
| Dyson street, east side, 1 north of Lenox avenue | 1 |
| Eighth street, south side, 2 east of Shell Road, north, 1 east of Whitney avenue | 2 |
| Elm street, northeast corner Myrtle avenue | 1 |
| Elm street, north side, 1 east of Summit place | 1 |
| Evelyn avenue, Fresh Pond Road to east of Jasmine street | 4 |
| Evergreen street, east side, 1 north of Jackson avenue | 1 |
| Fairview street, Corona to Myrtle avenue | 3 |
| Fifth street, east side, 1 north of Union avenue | 1 |

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| Location. | No. |
|---|---|
| Fisk avenue, Woodside avenue to Forest street | 4 |
| Floyd street, Rapalye to Corona avenues | 4 |
| Fosdick avenue, Myrtle to Central avenues | 2 |
| Fourth street, south side, 1 east of Whitney avenue | 1 |
| Foxhall street, north, 1 east of Onderdonk avenue | 1 |
| Foxhall street, Forest to Buckman avenues | 8 |
| Fresh Pond road, intersection of Cooper avenue | 2 |
| Fulton street, south side, 1 east of Summit place | 1 |
| Furman avenue, Long Island Railroad to Union avenue | 2 |
| Gates avenue, Forest to Fresh Pond road | 7 |
| Grove street, north side, 1 east of Medina place | 1 |
| Grove street, southwest corner Irving place | 1 |
| Grove street, north side, 1 east of Chicago avenue | 1 |
| Hanover avenue, Evergreen to Summit avenues | 3 |
| Highland avenue, southwest corner West Side Drive | 1 |
| Himrod street, northeast corner and south side, 1 east of Onderdonk avenue | 2 |
| Home street, Corona to Myrtle avenues | 3 |
| Irving place, Grove to Main streets | 2 |
| Jefferson street, south side, 1 east of Prospect avenue | 1 |
| Koerner avenue, Long Island Railroad, east | 3 |
| Lake street, Sycamore to Summit avenues | 12 |
| Lenox avenue, Woodside avenue to Forest street | 3 |
| Lincoln street, Park to Jackson avenues | 3 |
| Madison avenue, southwest corner Central avenue | 1 |
| Madison street, east side, 2 north of Cooper avenue | 1 |
| Madison street, Forest street to Prospect avenue | 4 |
| Medina place, east side, 1 north of Grove street | 1 |
| Montgomery street, Nassau to Lincoln streets | 3 |
| Myers avenue, Woodside avenue to Forest street | 3 |
| Myrtle avenue, Longfellow to Orchard avenues | 4 |
| Nurge street, west side, 1 north of Atlantic avenue | 1 |
| Onderdonk avenue, west side, 1 north of Stanhope street | 1 |
| Palmetto street, northeast corner Forest avenue | 1 |
| Palmetto street, Prospect avenue to Fresh Pond road | 4 |
| Park street, Myrtle to Summit avenues | 6 |
| Park avenue, corner McKinley and Roosevelt avenues | 2 |
| Prospect avenue, Frederick street and Metropolitan avenue | 2 |
| Rapalye avenue, Floyd to Pine streets | 2 |
| Sixth street, Shell road to Whitney avenue | 2 |
| Smith avenue, southeast corner Washington street | 1 |
| Slocum street, west side, 1 and 2 north of Elm street | 2 |

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| Location. | No. |
|---|---|
| St. Nicholas avenue, Gates and Woodbine avenues | 4 |
| St. Nicholas avenue, east, 1 north of Linden and east, 1 north of Gates avenue | 2 |
| Summit place, east, 1 north of Elm street | 1 |
| Suydam place, Court terrace to Chicago avenue | 2 |
| Third street, Newtown to Orchard avenues | 2 |
| Van Doren street, Cooper to Myrtle avenues | 4 |
| Warren street, east, 1 and 2 north of Carton street | 2 |
| Whitney avenue, east, 1 north of Sixth street | 1 |
| Willow avenue, south side, 1 east of Cypress avenue | 1 |
| William street, north side, 1 east of Atlantic avenue | 1 |
| Woodbine street, east of Forest avenue | 2 |
| Total | 185 |

Woodhaven District.

| Location. | No. |
|---|---|
| Benedict avenue, Grafton avenue and University place | 1 |
| Center street, east and west north of Sixth street | 2 |
| Clinton place, Grafton avenue to University place | 2 |
| Clinton avenue, Belmont avenue to Broadway | 2 |
| Court street, west side, 1 south of Graves place | 1 |
| Canal street, west side, 1 north of Grafton avenue | 1 |
| Ferry street, west side, 1 north of Grafton avenue | 1 |
| Ferry street, northwest corner Hillside avenue | 1 |
| Fourth street, University place to Atlantic avenue | 1 |
| Grant avenue, Atlantic to Fulton avenues | 4 |
| Grant avenue, northwest corner Poplar street | 1 |
| Hatch avenue, Grafton avenue to University place | 1 |
| Hoffman avenue, southwest corner Belmont avenue | 1 |
| Lawn avenue, east side, 1 north of Liberty avenue | 1 |
| Lawn avenue, west side, 1 north of Belmont avenue | 1 |
| Lutheran place, west side, 1 north of Rockaway road | 1 |
| McCormick avenue, east side, 1 north, and west side, 2 north of Rockaway road | 2 |
| Manor avenue, northeast corner Elm street | 1 |
| Morris avenue, Grafton avenue to University place | 1 |
| Napier avenue, University place and Atlantic avenue | 1 |
| Napier avenue, east side, 1 north of Broadway | 1 |
| Oakley avenue, west side, 1 and 2 north of Liberty avenue | 2 |
| Park place, Grafton avenue to University place | 1 |
| Pitkin place, north side, 1 east of Grant avenue | 1 |

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| Location. | No. |
|---|---|
| Second street, east side, 1 south of Rockaway road | 1 |
| Simpson street, northwest corner and 1 west of Ferry street | 2 |
| Shoe and Leather street, Spruce to Third streets | 2 |
| Shoe and Leather street, north, 1 east of Third street | 1 |
| Thrall place, University place to Broadway | 5 |
| Third street, east side, 1 south of Rockaway road | 1 |
| Union avenue, Rockaway road to Liberty avenue | 2 |
| Vanderveer avenue, northwest corner Ashland avenue | 1 |
| Washington avenue, west side, 1 north of Broadway | 1 |
| Water street, northwest corner Canal street | 1 |
| Walker avenue, University place to Woodhaven avenue | 1 |
| Walker avenue, Belmont avenue to Broadway | 4 |
| Woodhaven avenue, Hopkinson to Walker avenues | 1 |
| Woodhaven avenue, east side, 1 north of Rockaway road | 1 |
| Wyckoff avenue, Liberty to Belmont avenues | 4 |
| Broadway, north side, 1 east of Theaford avenue (police station) | 1 |
| Total | 61 |

Mantle Gas Lamps.

Richmond Hill District.

| Location. | No. |
|---|---|
| Beaufort street, north side, 1 east of Spruce street | 1 |
| Beech street, Chichester street and Atlantic avenue | 1 |
| Belmont avenue, corners Cedar and Elm streets | 2 |
| Briggs avenue, west side, 1 north of Chichester and Atlantic avenues | 2 |
| Cedar avenue, west side, 1 north of Belmont avenue | 1 |
| Cedar street, west side, 1 north of Broadway | 1 |
| Chichester avenue, Ward to Wicke avenue | 3 |
| Chichester avenue, Cedar to Elm street | 1 |
| Chichester avenue, Grove and Cedar avenues | 1 |
| Chestnut street, Liberty to Belmont avenue | 1 |
| Curtis avenue, Belmont to Garden street | 6 |
| Greenwood avenue, Broadway and Liberty avenue | 7 |
| Grove street, west side, 1 north of Atlantic avenue, and, west, 1 north of Chichester avenue | 2 |
| Lincoln avenue, west side, 1 north of Orchard street | 1 |
| Myrtle avenue, Long Island Railroad to Richmond Hill station | 1 |
| Oak street, Broadway to Liberty avenue | 6 |
| Sherman street, southwest corner Beaufort street | 1 |

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| Location. | No. |
|---|---|
| Spruce street, southeast corner Chichester avenue | 1 |
| Vine street, Belmont to Chichester avenue | 7 |
| Walnut street, east side, 1 north of Long Island Railroad | 1 |
| Washington avenue, southeast corner Orchard avenue | 1 |
| Wickes street, Belmont to Elm avenue | 2 |
| Total | 50 |

Jamaica District.

| Location. | No. |
|---|---|
| Abbott place, Beaufort to Chichester avenue | 2 |
| Alsop street, Grove to Willett avenue | 2 |
| Archer place, south side, 1 east of Tyndall street | 1 |
| Avalon avenue, Fulton street, North First street | 2 |
| Bandmann avenue, northwest corner Dean street | 1 |
| Bergen avenue, Hillside to Highland avenue | 3 |
| Bergen place, south side, 1 east of Bergen avenue | 1 |
| Bath place, northwest corner Lester avenue | 1 |
| Canal street, east side, 1 north of Willow street | 1 |
| Central avenue, north side, 1 east of Curtis avenue and Willow street | 2 |
| Chichester avenue, Longfellow to Tyndall avenue | 6 |
| Clinton avenue, Fulton to Hillside avenue | 6 |
| Clinton place, Union to Park avenue | 2 |
| Clinton avenue, west side, 1 north of Fulton street | 1 |
| Curtis street, east side, 1 south of Hillside avenue | 1 |
| Dakota avenue, south of Wyoming street | 2 |
| Dewey avenue, southwest corners of Theodore and Herbert streets | 2 |
| Grove street, opposite John street | 1 |
| Hackett street, east and west sides, 1 north of South street | 2 |
| Harriman avenue, east side, 1 north of Fulton street | 1 |
| Harriman avenue, Shelton to Hillside avenue | 3 |
| Hardenbrook avenue, Fulton to Hillside avenue | 4 |
| Hulst street, east side, 1 north of Liberty avenue | 1 |
| Humboldt boulevard, corner Baltic, Dean and Jay streets | 3 |
| John street, Charles place to Grove street | 1 |
| Johnson avenue, south side, 1 west of Guilfort street | 1 |
| Morris avenue, Stewart avenue to Fulton street | 4 |
| Park avenue, Clinton place to Highland avenue | 1 |
| Shelton avenue, Union to Clinton avenue | 2 |
| Shelton avenue, south side, 1 east of Ray street; north, 1 east of Alsop street | 2 |

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| Location. | No. |
|---|---|
| Sycamore place, Washington avenue to Long Island Railroad | 2 |
| Ray street, Willet street to Hillside avenue | 1 |
| Union avenue, Fulton to Hillside avenue | 6 |
| Union Hall street, Atlantic to Fulton avenue | 2 |
| Willett avenue, Carlton to Myrtle avenue | 1 |
| Willett avenue, Ray street east and Flushing avenue | 2 |
| Willow street, south side, 1 and 2 east of Canal street | 2 |
| Willow place, Washington avenue to Long Island Railroad | 1 |
| Willow street, east side, 1 north of Central avenue | 1 |
| Total | 80 |
| Hardenbrook avenue, south of Hillside avenue (Church) | 2 |
| Total | 82 |

Arverne and Rockaway District.

| Location. | No. |
|---|---|
| Columbus avenue, east side and west side, 1 north of Board walk, and east side, 1 north of Washington avenue | 3 |
| Eighth avenue, east side, 1 north of Washington avenue | 1 |
| Fifth avenue, west side, 1 north of Washington avenue | 1 |
| Hammels avenue, west side and east side, 1 north of Long Island Railroad | 2 |
| Newport avenue, corner Sixth, Seventh, Eighth, Ninth, Tenth, West End and Columbus avenues | 7 |
| Ninth avenue, east side, 1 north of Washington avenue | 1 |
| Seventh avenue, east side, 1 north of Washington avenue | 1 |
| Sixth avenue, east side, 1 north of Washington avenue | 1 |
| Tenth avenue, west side, 1 north of Washington avenue | 1 |
| West End avenue, east side and west side, 1 north of Board walk, and east side, 1 north of Washington avenue | 3 |
| Total | 21 |

## Table O.

Showing Locations at Which New Lamps Were Installed During Year 1908.

BOROUGH OF RICHMOND.

Electric Arc Lamps, Richmond Light and Railroad Company.

| Location. | No. |
|---|---|
| Amboy road, corner of Huguenot avenue | 1 |
| Amboy road, corner of Weir avenue | 1 |
| Arents avenue, Main street and Johnson avenue | 1 |

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| Location. | No. |
|---|---|
| Broadway, Port Richmond | 1 |
| Clove avenue, railroad crossing | 1 |
| Crescent avenue, Bismarck and Beechwood avenues | 2 |
| Cross street, corner Front street, Stapleton | 1 |
| Dorgan street, corner of Cedar street | 1 |
| Heberton avenue, corner of Albion place | 1 |
| Huguenot avenue, at railroad crossing | 1 |
| Jay street | 1 |
| Marion avenue, corner of Palmer avenue | 1 |
| New York avenue, Westerleigh | 1 |
| Ohio place, corner of College avenue | 1 |
| Palmer avenue, corner of Cebra avenue | 1 |
| Prospect street, at railroad crossing (Stapleton) | 1 |
| Pennsylvania avenue, corner of Rosebank place | 1 |
| Richmond avenue, corner of La Forge avenue | 1 |
| Richmond road, corner of Student street | 1 |
| Richmond turnpike, corner of Sarahann street | 1 |
| Rockland avenue, New road and Richmond avenue | 1 |
| St. Marks place, corner Nicholas street | 1 |
| Smith terrace, at end of street | 1 |
| Tompkins avenue, corner of Twigg alley | 1 |
| Van Pelt avenue, at railroad crossing | 1 |
| Washington avenue, corner of Richmond road | 1 |
| Total | 27 |

Mantle Gas Lamps, Welsbach Street Lighting Company.

West New Brighton District.

| Location. | No. |
|---|---|
| Bard avenue, Forest avenue to Richmond terrace | 21 |
| Barker avenue, Castleton avenue and Woodruff lane | 5 |
| Bement avenue, Forest avenue to Richmond terrace | 18 |
| Bodine street, Castleton avenue to Richmond terrace | 5 |
| Berger avenue, Cary avenue to Richmond terrace | 12 |
| Caroline street, south of Cary avenue to Castleton avenue | 4 |
| Cary avenue, Brook road to Bement avenue | 13 |
| Cedar street, Bodine and Taylor streets | 2 |
| Davis avenue, Castleton avenue to Richmond terrace | 14 |
| Dongan street, Cary avenue to Richmond terrace | 8 |
| Elizabeth street, Forest avenue to Castleton avenue | 8 |
| Myrtle avenue, Elizabeth street and Broadway | 3 |

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| Location. | No. |
|---|---|
| Oakland avenue, Cary avenue and Castleton avenue | 2 |
| Prospect avenue, Brook road to Broadway | 7 |
| Roe street, Prospect avenue to Castleton avenue | 6 |
| St. Austins place, St. Austins Place South to St. Austins Place North | 2 |
| Taylor street, Prospect avenue to Richmond terrace | 12 |
| Trinity place, Taylor street and Barker street | 2 |
| Water street, Woodruff lane and Richmond terrace | 2 |
| Woodruff lane, Barker avenue and Water street | 1 |
| Total | 147 |

Port Richmond District.

| Location. | No. |
|---|---|
| Albion place, Richmond road to Washington place | 5 |
| Anderson avenue, Heberton avenue and Simonson place | 3 |
| Ann street, Richmond road to Avenue B | 3 |
| Bennett street, Richmond road and Avenue B | 4 |
| Bond street, Heberton and Jewett avenues | 5 |
| Broadway, south of Elizabeth street to Richmond terrace | 7 |
| Cottage place, Elizabeth and Bennett streets | 3 |
| Elizabeth street, Richmond road and Cottage place | 4 |
| Grace Church place, Heberton avenue and Simonson place | 3 |
| Heberton avenue, Blackford avenue to Ann street | 13 |
| Mesereau avenue, Richmond road and Heberton avenue | 3 |
| New street, Cottage place and Jewett avenue | 2 |
| Simonson place, Catherine and Bond streets | 4 |
| Vreeland street, Richmond road and Heberton avenue | 3 |
| Washington place, south of Albion place to Anderson avenue | 2 |
| Total | 64 |

Tower Hill District.

| Location. | No. |
|---|---|
| Harrison avenue, Nicholas avenue to Richmond road | 6 |
| Hatfield avenue, Nicholas avenue to Richmond road | 6 |
| Lafayette avenue, Slaight avenue to Richmond terrace | 5 |
| Maple avenue, Harrison avenue to Richmond terrace | 5 |
| Richmond terrace, Sharp and Lafayette avenues | 1 |
| Slaight avenue, Nicholas avenue and Lafayette avenue | 1 |
| Total | 24 |

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## TABLE P.

Showing Mileage of Streets Lighted by Electricity, Gas and Naphtha Lamps in Manhattan and The Bronx During the Year 1908.

| | Electric. | | | | Mantle. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Arc. | | Incandescent. | | Gas. | | Naphtha. | | Total. | |
| | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. |
| **Manhattan.** | | | | | | | | | | |
| January 1, 1908..... | 185 | 4,032 | 1 | 3,913 | 252 | 3,364 | 8 | 2,085 | 448 | 2,834 |
| Additional during 1908.... | 12 | 2,170 | .. | 4,200 | .. | 3,575 | .. | .... | 13 | 4,665 |
| Discontinued during 1908.. | .. | .... | .. | .... | 9 | 475 | 3 | 4,710 | 12 | 5,185 |
| December 31, 1908.. | 198 | 922 | 2 | 2,833 | 244 | 1,184 | 4 | 2,655 | 449 | 2,314 |
| **The Bronx.** | | | | | | | | | | |
| January 1, 1908..... | 146 | 930 | 10 | 4,640 | 132 | 3,107 | 43 | 4,721 | 333 | 2,838 |
| Additional during 1908.... | 3 | 4,755 | 3 | 3,325 | 5 | 35 | .. | 3,182 | 13 | 737 |
| Disontinued during 1908.. | .. | 3,400 | .. | .... | .. | 3,725 | 2 | 4,250 | 4 | 815 |
| December 31, 1908.. | 149 | 2,285 | 14 | 2,685 | 136 | 4,697 | 41 | 3,653 | 342 | 2,760 |
| Total, both Boroughs. | 347 | 3,207 | 17 | 238 | 381 | 601 | 46 | 1,028 | 791 | 5,074 |

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## TABLE Q.

Showing Length of Mains in Use by the Various Gas Companies in the Greater City During the Year 1908.

| Borough and Company. | In Use January 1, 1908. | | New Mains Laid. | | Mains Disused. | | Mains Taken Up. | | In Use December 31, 1908. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. |
| **Manhattan.** | | | | | | | | | | |
| Consolidated Gas Company... | 795 | 1,109 | 8 | 986 | 5 | 3,491 | 4 | 2,249 | 793 | 1,635 |
| New Amsterdam Gas Company ..... | 247 | 1,687 | .. | 1,658 | .. | 2,187 | .. | 2,061 | 246 | 4,377 |
| New York Mutual Gas Light Company ..... | 169 | 3,127 | .. | .... | .. | 562 | .. | 300 | 169 | 2,265 |
| Standard Gas Light Company | 195 | 4,143 | .. | .... | .. | 211 | .. | 56 | 195 | 3,876 |
| Total..... | 1,407 | 4,786 | 8 | 2,644 | 6 | 1,171 | 4 | 4,666 | 1,405 | 1,593 |
| **The Bronx.** | | | | | | | | | | |
| Consolidated Gas Company... | 2 | 3,597 | .. | .... | .. | .... | .. | .... | 2 | 3,597 |
| Central Union Gas Company. | 133 | 380 | 4 | 789 | .. | 3,412 | .. | 400 | 136 | 2,637 |
| Northern Union Gas Company | 145 | 2,530 | 7 | 1,121 | 1 | 431 | 1 | 1,099 | 150 | 2,121 |
| Standard Gas Light Company | 6 | 4,307 | .. | .... | .. | .... | .. | .... | 6 | 4,307 |
| Westchester Lighting Company ..... | 29 | 4,046 | .. | 305 | .. | .... | .. | .... | 29 | 4,351 |
| Bronx Gas and Electric Company ..... | 31 | 2,052 | 1 | 2,555 | .. | .... | .. | 369 | 32 | 4,238 |
| Total..... | 349 | 1,072 | 12 | 4,770 | 1 | 3,843 | 1 | 1,868 | 359 | 131 |
| **Brooklyn.** | | | | | | | | | | |
| Brooklyn Union Gas Company | 847 | 5,209 | 12 | 3,251 | .. | 5,048 | 2 | 2,650 | 857 | 762 |
| Brooklyn Borough Gas Company ..... | 63 | 1,615 | 5 | 2,249 | .. | .... | .. | .... | 68 | 3,864 |
| Flatbush Gas Company..... | 74 | 3,707 | 4 | 884 | 1 | 1,142 | .. | .... | 77 | 3,449 |
| Kings County Lighting Company ..... | 140 | 4,393 | 4 | 820 | .. | 2,420 | .. | 4,951 | 143 | 3,122 |
| Total..... | 1,126 | 4,364 | 26 | 1,924 | 2 | 3,330 | 3 | 2,321 | 1,147 | 637 |
| **Queens.** | | | | | | | | | | |
| Astoria Light, Heat and Power Company ..... | .. | 3,687 | .. | .... | .. | .... | .. | .... | .... | 3,687 |
| New York and Queens Gas Company ..... | 63 | 373 | 5 | 440 | .. | .... | .. | .... | 68 | 813 |

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| Borough and Company. | In Use January 1, 1908. | | New Mains Laid. | | Mains Disused. | | Mains Taken Up. | | In Use December 31, 1908. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. |
| Newtown Gas Company..... | 111 | 4,813 | 5 | 298 | .. | .... | .. | 236 | 116 | 4,875 |
| Richmond Hill and Queens County Gas Light Company | 23 | 4,800 | 2 | 1,772 | .. | .... | .. | 930 | 26 | 362 |
| Jamaica Gas Light Company. | 40 | 1,354 | 6 | 604 | .. | .... | .. | 1,299 | 46 | 659 |
| Woodhaven Gas Light Company ..... | 36 | 924 | 4 | 1,651 | .. | .... | 1 | 1,074 | 39 | 1,501 |
| East River Gas Company.... | 66 | 1,599 | 2 | 4,372 | .. | 1,612 | 1 | 991 | 67 | 3,368 |
| Queens Borough Gas and Electric Company ..... | 40 | 2,827 | .. | 2,365 | .. | .... | .. | .... | 40 | 5,192 |
| Total..... | 382 | 4,537 | 26 | 942 | .. | 1,612 | 2 | 4,530 | 405 | 4,617 |
| Richmond. | | | | | | | | | | |
| New York and Richmond Gas Company ..... | 81 | 4,382 | 1 | 4,945 | .. | .... | .. | .... | 83 | 4,047 |
| Greater City. | | | | | | | | | | |
| Manhattan ..... | 1,407 | 4,786 | 8 | 2,644 | 6 | 1,171 | 4 | 4,666 | 1,405 | 1,593 |
| The Bronx..... | 349 | 1,072 | 12 | 4,770 | 1 | 3,843 | 1 | 1,868 | 359 | 131 |
| Brooklyn ..... | 1,126 | 4,364 | 26 | 1,924 | 2 | 3,330 | 3 | 2,321 | 1,147 | 637 |
| Queens ..... | 382 | 4,537 | 26 | 952 | .. | 1,612 | 2 | 4,530 | 405 | 4,617 |
| Richmond ..... | 81 | 4,382 | 1 | 4,945 | .. | .... | .. | .... | 83 | 4,047 |
| Grand total..... | 3,348 | 3,301 | 75 | 4,665 | 10 | 4,676 | 12 | 2,825 | 3,401 | 465 |

Note—The figures for electrical conductors are included in the report of the Electrical Bureau.

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# TABLE R.

## Showing Lamp Material on Hand December 31, 1908.

| Borough and Company. | Posts. | | | | Boulevard, One-Piece. | Brackets. | Crossheads. |
|---|---|---|---|---|---|---|---|
| | Corporation. | | Empire. | | | | |
| | Butts. | Columns. | Butts. | Columns. | | | |
| *Manhattan. | | | | | | | |
| Company and City Store Yards..... | 903 | 1,395 | 68 | 68 | 210 | 41 | 384 |
| *The Bronx ..... | 47 | 10 | .... | .... | .... | .... | .... |
| Brooklyn. | | | | | | | |
| Brooklyn Union Gas Company..... | 73 | 80 | .... | .... | .... | .... | .... |
| Kings County Lighting Company..... | 40 | 40 | .... | .... | .... | .... | .... |
| Total..... | 113 | 120 | .... | .... | .... | .... | .... |
| Queens. | | | | | | | |
| New York and Queens Gas Company... | 2 | 2 | .... | .... | .... | .... | .... |
| Newtown Gas Company..... | 3 | 3 | .... | .... | .... | .... | .... |
| Richmond Hill and Queens County Gas Company ..... | 5 | 5 | .... | .... | .... | .... | .... |
| Jamaica Gas Light Company..... | 17 | 12 | .... | .... | .... | .... | .... |
| Woodhaven Gas Light Company..... | 6 | 6 | .... | .... | .... | .... | .... |
| Queens Borough Gas and Electric Company ..... | 9 | 9 | .... | .... | .... | .... | .... |
| Total..... | 42 | 37 | .... | .... | .... | .... | .... |
| Richmond. | | | | | | | |
| New York and Richmond Gas Company. | 46 | 46 | .... | .... | .... | .... | 300 |
| Total, Greater New York.. | 1,151 | 1,608 | 68 | 68 | 210 | 41 | 684 |

* For detailed statement of material on hand in Manhattan and The Bronx, see report of General Inspector Porcella.

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## TABLE S.

Showing Kinds of Lamps, Estimated Candle Power and Population for the Years 1901 to 1908, Inclusive, by Boroughs and Years.

MANHATTAN.

| End of Year. | Electric. | | Gas. | Naphtha. | Total. | Population. | Candle-power. |
|---|---|---|---|---|---|---|---|
| | Arc. | Incandescent. | | | | | |
| 1901..... | 2,785 | 40 | 18,326 | 865 | 22,016 | 1,929,512 | 2,290,154 |
| 1902..... | 2,880 | 44 | 18,149 | 863 | 21,936 | 1,981,417 | 2,371,176 |
| 1903..... | 2,940 | 200 | 19,029 | 863 | 23,032 | 2,034,720 | 2,401,880 |
| 1904..... | 3,104 | 198 | 18,304 | 907 | 22,513 | 2,089,457 | 3,028,350 |
| 1905..... | 3,331 | 84 | 17,003 | 1,075 | 21,493 | 2,145,666 | 3,206,066 |
| 1906..... | 3,677 | 92 | 16,190 | 1,116 | 21,075 | 2,203,388 | 3,388,036 |
| 1907..... | 4,009 | 147 | 15,500 | 1,119 | 20,775 | 2,262,661 | 3,559,965 |
| 1908..... | 4,538 | 520 | 14,729 | 862 | 20,649 | 2,323,530 | 3,852,630 |

THE BRONX.

| End of Year. | Electric. | | Gas. | Naphtha. | Total. | Population. | Candle-power. |
|---|---|---|---|---|---|---|---|
| | Arc. | Incandescent. | | | | | |
| 1901..... | 1,727 | 368 | 5,260 | 1,518 | 8,873 | 220,732 | 947,332 |
| 1902..... | 1,907 | 378 | 5,606 | 1,466 | 9,357 | 234,558 | 1,050,416 |
| 1903..... | 1,939 | 380 | 5,648 | 1,432 | 9,399 | 249,241 | 1,068,060 |
| 1904..... | 1,971 | 392 | 5,829 | 1,481 | 9,673 | 264,843 | 1,364,948 |
| 1905..... | 2,051 | 386 | 6,108 | 1,712 | 10,257 | 281,422 | 1,422,266 |
| 1906..... | 2,195 | 388 | 6,015 | 1,826 | 10,424 | 299,037 | 1,580,748 |
| 1907..... | 2,324 | 390 | 6,080 | 1,888 | 10,682 | 317,758 | 1,647,806 |
| 1908..... | 2,461 | 531 | 6,289 | 1,788 | 11,069 | 337,649 | 1,739,522 |

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BROOKLYN.

| End of Year. | Electric. | | Gas. | Naphtha. | Total. | Population. | Candle-power. |
|---|---|---|---|---|---|---|---|
| | Arc. | Incandescent. | | | | | |
| 1901..... | 4,882 | .... | 14,276 | 371 | 19,529 | 1,224,250 | 2,299,970 |
| 1902..... | 4,964 | .... | 14.529 | 401 | 19,894 | 1,262,188 | 2,366,642 |
| 1903..... | 4,964 | 348 | 14,886 | 405 | 20,603 | 1,301,392 | 2,369,954 |
| 1904..... | 4,973 | 348 | 15,326 | 468 | 21,115 | 1,341,722 | 2,406,212 |
| 1905..... | 5,060 | .... | 16,333 | 493 | 21,886 | 1,383,300 | 2,516,600 |
| 1906..... | 5,191 | .... | 16,816 | 493 | 22,500 | 1,426,166 | 3,119,368 |
| 1907..... | 5,345 | .... | 17,733 | 668 | 23,746 | 1,470,361 | 4,002,120 |
| 1908..... | 5,423 | .... | 18,201 | 668 | 24,292 | 1,515,926 | 4,179,218 |

QUEENS.

| End of Year. | Electric. | | Gas. | Naphtha. | Total. | Population. | Candle-power. |
|---|---|---|---|---|---|---|---|
| | Arc. | Incandescent. | | | | | |
| 1901..... | 2,089 | 160 | 3,519 | 1,368 | 7,136 | 166,079 | 935,156 |
| 1902..... | 2,113 | 160 | 3,520 | 1,368 | 7,161 | 174,911 | 944,816 |
| 1903..... | 2,111 | 160 | 3,535 | 1,358 | 7,164 | 184,212 | 944,412 |
| 1904..... | 2,123 | 160 | 3,550 | 1,261 | 7,094 | 194,007 | 944,292 |
| 1905..... | 2,357 | 175 | 3,623 | 883 | 7,038 | 204,329 | 1,049,583 |
| 1906..... | 2,523 | 175 | 3,409 | 738 | 6,845 | 215,189 | 1,261,579 |
| 1907..... | 2,423 | 275 | 4,323 | 677 | 7,698 | 226,632 | 1,277,455 |
| 1908..... | 2,320 | 1,737 | 4,603 | 18 | 8,678 | 238,683 | 1,164,500 |

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## RICHMOND.

| End of Year. | Electric. Arc. | Electric. Incandescent. | Gas. | Oil. | Total. | Population. | Candlepower. |
|---|---|---|---|---|---|---|---|
| 1901..... | 508 | 3,508 | .... | 100 | 4,116 | 68,813 | 292,100 |
| 1902..... | 567 | 3,588 | .... | 100 | 4,255 | 69,970 | 317,700 |
| 1903..... | 568 | 3,586 | .... | 100 | 4,254 | 71,146 | 318,050 |
| 1904..... | 568 | 3,586 | .... | 100 | 4,254 | 72,342 | 318,050 |
| 1905..... | 592 | 3,603 | .... | 100 | 4,295 | 73,558 | 328,075 |
| 1906..... | 632 | 3,933 | .... | 100 | 4,665 | 74,795 | 352,325 |
| 1907..... | 664 | 3,933 | .... | .... | 4,597 | 76,052 | 463,525 |
| 1908..... | 699 | 3,744 | 235 | .... | 4,678 | 77,330 | 492,150 |

## GREATER NEW YORK.

| End of Year. | Electric. Arc. | Electric. Incandescent. | Gas. | Naphtha. | Total. | Population. | Candlepower. |
|---|---|---|---|---|---|---|---|
| 1901..... | 11,991 | 4,076 | 41,381 | 4,222 | 61,670 | 3,609,386 | 6,764,612 |
| 1902..... | 12,431 | 4,170 | 41,804 | 4,198 | 62,603 | 3,723,044 | 7,052,750 |
| 1903..... | 12,522 | 4,674 | 43,098 | 4,158 | 64,452 | 3,840,711 | 7,102,356 |
| 1904..... | 12,739 | 4,684 | 43,009 | 4,217 | 64,649 | 3,962,371 | 8,061,852 |
| 1905..... | 13,391 | 4,248 | 43,067 | 4,263 | 64,969 | 4,088,275 | 8,542,590 |
| 1906..... | 14,218 | 4,588 | 42,430 | 4,273 | 65,509 | 4,218,577 | 9,702,056 |
| 1907..... | 14,765 | 4,745 | 43,636 | 4,352 | 67,498 | 4,353,464 | 10,950,871 |
| 1908..... | 15,441 | 6,532 | 44,057 | 3,336 | 69,366 | 4,493,118 | 11,428,020 |

Note—Oil lamps in Richmond are included in naphtha lamps for the Greater City. For details as to number of each type of lamp, 1901 to 1907, see Table "G," 1907 report, and for 1908 see Tables "A" to "G" of this report.

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## TABLE T.

Showing Lamps Burning at Residences of Mayors on December 31, 1908.

| Mayor. | Term of Office. | Residence. | Date Lighted. | Number of Posts. | Kind. |
|---|---|---|---|---|---|
| Wickham, W. H..... | 1875-76 | Lexington avenue, west side, Thirty-ninth and Fortieth streets ..... | June 1, 1875 | 2 | Gas |
| Grace, W. R..... | 1885-86 | No. 31 East Seventy-ninth street ..... | Nov. 1, 1893 | 2 | Gas |
| Hewitt, A. S..... | 1887-88 | Lexington avenue, southeast corner Twenty-second street | Nov. 10, 1887 | 2 | Gas |
| Grant, H. J..... | 1889-92 | No. 20 East Seventy-second street ..... | Oct. 20, 1900 | 2 | Elec. |
| Gilroy, T. F..... | 1893-94 | No. 7 West One Hundred and Twenty-first street ..... | April 24, 1893 | 2 | Gas |
| Low, Seth..... | 1902-03 | No. 30 East Sixty-fourth street ..... | Jan. 5, 1903 | 2 | Elec. |
| McClellan, Geo. B..... | 1904-09 | No. 12 Washington Square North ..... | Mar. 30, 1904 | 2 | Elec. |

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## TABLE U.

### Showing Number of Lamps in Parks, December 31, 1908.

BOROUGH OF MANHATTAN.

| Park and Boundaries. | Acres. | Arc. | Incandescent. | Gas. | Naphtha. |
|---|---|---|---|---|---|
| Abingdon Square, Hudson street, Eighth avenue and West Twelfth street | 0.202 | 1 | .. | .. | .. |
| Battery, Battery | 21.199 | 27 | .. | .. | .. |
| Bryant, Sixth avenue, Fortieth and Forty-second streets | 4.775 | 14 | .. | .. | .. |
| Central, Fifth and Eighth avenues, Fifty-ninth and One Hundred and Tenth streets | 843.019 | 2 | .. | 33 | 580 |
| Christopher Street, Christopher, Grove and Fourth streets | 0.139 | 1 | .. | .. | .. |
| City Hall, Broadway and Park row, Mail and Chambers streets | 8.239 | 17 | 8 | .. | .. |
| Colonial, Bradhurst and Edgecombe avenues, One Hundred and Forty-fifth and One Hundred and Fifty-fifth streets | 12.790 | .. | .. | .. | 2 |
| Fort Washington, Lafayette boulevard, One Hundred and Seventy-first and One Hundred and Eighty-third streets | 40.810 | .. | .. | 15 | .. |
| Corlears Hook, South and Corlears streets, Jackson and Cherry streets | 8.300 | 13 | .. | .. | .. |
| DeWitt Clinton, Eleventh and Twelfth avenues, Fifty-second and Fifty-fourth streets | 7.377 | 13 | .. | .. | .. |
| East River, East End avenue, Eighty-fourth and Eighty-ninth streets | 12.546 | 27 | .. | .. | .. |
| Hamilton Fish, Houston and Pitt, Sheriff and Stanton streets | 3.673 | 16 | .. | .. | .. |
| Harlem Lane, Seventh avenue and Macombs lane, One Hundred and Fifty-third and One Hundred and Fifty-fifth streets | 1.270 | .. | .. | .. | 3 |
| High Bridge, One Hundred and Fifty-fifth to Dyckman street and Harlem River | 64.343 | .. | 17 | 5 | .. |
| Hudson, Hudson and Leroy streets, Varick and Clarkson streets | 1.700 | 7 | 38 | .. | .. |
| Jackson Square, Greenwich avenue, Thirteenth street, Eighth avenue | 0.227 | 1 | .. | .. | .. |
| John Jay, East River, Seventy-sixth and Seventy-Seventh streets | 3.004 | 5 | .. | .. | .. |
| Thomas Jefferson, One Hundred and Eleventh and One Hundred and Fourteenth streets, First avenue and East River | 15.529 | 10 | .. | .. | .. |
| Madison Square, Broadway and Madison avenue, Twenty-third and Twenty-sixth streets | 6.840 | 20 | .. | .. | .. |
| Manhattan Square, Central Park West and Columbus avenue, Seventy-seventh and Eighty-first streets | 17.582 | .. | .. | .. | 4 |
| Morningside, One Hundred and Tenth and One Hundred and Twenty-third streets | 31.238 | .. | .. | .. | 34 |
| Mount Morris, Madison avenue, One Hundred and Twentieth and One Hundred and Twenty-fourth streets | 20.174 | 19 | .. | .. | .. |
| Mulberry Bend, Mulberry and Baxter streets | 2.750 | 11 | .. | .. | .. |

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| Park and Boundaries. | Acres. | Arc. | Incandescent. | Gas. | Naphtha. |
|---|---|---|---|---|---|
| Riverside, Seventy-second and One Hundred and Twenty-ninth streets | 140.037 | 21 | 250 | .. | .. |
| Riverside Drive Extension, One Hundred and Thirty-fifth and One Hundred and Forty-fifth streets | ..... | .. | 9 | .. | .. |
| Ryan, East Forty-second street, First and Second avenues | 0.180 | 1 | .. | .. | .. |
| St. Gabriel's, First and Second avenues, Thirty-fifth and Thirty-sixth streets | 2.947 | 5 | .. | .. | .. |
| St. Nicholas, One Hundred and Twenty-seventh and One Hundred and Forty-first streets, St. Nicholas avenue and St. Nicholas terrace | 26.604 | 1 | 49 | .. | .. |
| William H. Seward, Division and Hester streets, Canal and Essex streets | 3.315 | 9 | .. | .. | .. |
| Stuyvesant Square, Second avenue, Fifteenth and Seventeenth streets | 4.229 | 16 | .. | .. | .. |
| Tompkins Square, Avenues A and B, Seventh and Tenth streets | 10.508 | 20 | .. | 2 | .. |
| Union Square, Fourth avenue and Broadway, Fourteenth and Seventeenth streets | 3.483 | 10 | .. | .. | .. |
| Washington Square, Wooster and Macdougal, Fourth street and Waverly place | 8.115 | 15 | .. | 1 | .. |
| Unnamed, Seventeenth street and East River, Seventeenth and Eighteenth streets, east of Avenue A | ..... | .. | .. | .. | 4 |
| Unnamed, Twenty-third street and Eleventh avenue | ..... | 1 | .. | .. | .. |
| Total number of lamps | | 303 | 371 | 56 | 627 |

## BOROUGH OF THE BRONX.

| Park and Location. | Acres. | Arc. | Incandescent. | Gas. | Naphtha. |
|---|---|---|---|---|---|
| Bronx, West Farms | 719 | .. | .. | 5 | 226 |
| Crotona, Tremont | 155 | .. | .. | .. | 89 |
| Claremont, Morrisania | 38 | .. | .. | .. | 53 |
| Echo Mount Hope | 4 | .. | .. | .. | 9 |
| Franz Sigel, Mott Haven | 17 | .. | .. | .. | 18 |
| Melrose, Melrose | 1 | .. | .. | .. | 5 |
| Pelham Bay, Baychester | 1,756 | 3 | .. | .. | 67 |
| St. James, Fordham | 12 | .. | .. | .. | 3 |
| St. Mary's, Mott Haven | 29 | .. | .. | .. | 55 |
| Van Cortlandt, Van Cortlandt | 1,132 | 9 | .. | .. | 29 |
| Washington Bridge, Washington Bridge | 9 | .. | .. | .. | 24 |
| Total number of lamps | | 12 | .. | 5 | 578 |

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BOROUGH OF BROOKLYN.

| Park and Boundaries. | Acres. | Arc. | Incandescent. | Gas. | Naphtha. |
|---|---|---|---|---|---|
| Bedford, Prospect place and Park place, Brooklyn and Kingston avenues | 4.1 | 2 | .. | .. | .. |
| Bushwick, Knickerbocker and Irving avenues, Suydam and Starr streets | 6.86 | .. | .. | .. | 22 |
| Carroll, Court and Smith streets, President and Carroll. | 1.9 | .. | .. | .. | 18 |
| Cooper, Olive street and Morgan avenue, Sharon and Maspeth avenues | 6.1 | .. | .. | .. | 14 |
| City, Navy and St. Edwards streets, Park and Flushing avenues | 7.5 | .. | .. | .. | 21 |
| Fort Greene, DeKalb and Myrtle avenues, St. Edwards and Washington streets | 28.7 | 2 | .. | .. | 52 |
| McLaughlin, Jay and Bridge streets, Strykers court and Tillary street | 3.3 | 7 | .. | .. | .. |
| Prospect, Ocean and Coney Island avenues, Ninth and Flatbush avenues | 526.00 | 5 | .. | .. | 278 |
| Red Hook, Verona and William streets, Richards and Dwight streets | 5.28 | .. | .. | .. | 15 |
| Saratoga Square, Halsey and Macon streets, Saratoga and Howard avenues | 3.2 | 2 | .. | .. | .. |
| Seaside, Concourse, Sea Breeze avenue, West Fifth street and Ocean parkway | 10.3 | .. | .. | .. | 24 |
| Sunset, Fifth and Seventh avenues, Forty-first and Forty-fourth streets | 24.5 | .. | .. | .. | 32 |
| Tompkins, Marcy and Tompkins avenues, Lafayette and Greene avenues | 7.8 | .. | .. | .. | 27 |
| Winthrop, Monitor and Russell streets, Briggs and Nassau avenues | 9.1 | .. | .. | .. | 22 |
| Williamsburg Bridge, Kent and Barry avenues, South Sixth and South Fifth streets | 4.3 | .. | .. | .. | 13 |
| Total number of lamps | | 18 | .. | .. | 538 |

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## BOROUGH OF QUEENS.

| Park and Location. | Acres. | Arc. | Incandescent. | Gas. | Naphtha. |
|---|---|---|---|---|---|
| College Point, College Point | 1.14 | 1 | .. | .. | .. |
| Linden, Corona | 3.00 | 2 | .. | .. | .. |
| Kings, Jamaica | 11.50 | .. | .. | .. | 12 |
| Total number of lamps | | 3 | .. | .. | 12 |

## BOROUGH OF RICHMOND.

| Park and Location. | Acres. | Arc. | Incandescent. | Gas. | Naphtha. |
|---|---|---|---|---|---|
| Washington Square, Stapleton | 1.46 | 2 | .. | .. | .. |
| Total number of lamps | | 2 | .. | .. | .. |

## Recapitulation.

| Borough. | Number of Parks Lighted. | Lamps. | | | | |
|---|---|---|---|---|---|---|
| | | Arc. | Incandescent. | Gas. | Naphtha. | Total. |
| Manhattan | 35 | 303 | 371 | 56 | 627 | 1,357 |
| The Bronx | 11 | 12 | .. | 5 | 578 | 595 |
| Brooklyn | 15 | 18 | .. | .. | 538 | 556 |
| Queens | 3 | 3 | .. | .. | 12 | 15 |
| Richmond | 1 | 2 | .. | .. | .. | 2 |
| Total, Greater City | 65 | 338 | 371 | 61 | 1,755 | 2,525 |

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## TABLE V.

### Showing Number of Bridge Lamps in Use December 31, 1908.

| | Length in Feet. | Electric. | | Gas. | |
|---|---|---|---|---|---|
| | | Arc. | Incandescent. | Mantle. | Open Flame. |
| **City Lamps on Street Service.** | | | | | |
| Central Bridge | 2,540 | 18 | *4 | .. | .. |
| City Island Bridge | 1,675 | 16 | .. | .. | .. |
| High Bridge | 1,400 | .. | .. | 25 | .. |
| Madison Avenue Bridge | 1,880 | 8 | .. | .. | .. |
| Pelham Bridge | 1,900 | 15 | .. | .. | .. |
| Putnam Railroad Bridge | 1,000 | .. | .. | 1 | 9 |
| Second Avenue Bridge | 700 | 1 | .. | .. | 1 |
| Ship Canal Bridge | 546 | 3 | .. | .. | .. |
| University Heights Bridge | 1,085 | 14 | *2 | .. | .. |
| Washington Bridge | 2,399 | 11 | .. | .. | .. |
| One Hundred and Forty-fifth Street Bridge | 1,603 | 24 | *4 | .. | .. |
| Total | 16,728 | 110 | 10 | 26 | 10 |
| **City Lamps, Isolated Plant Service.** | | | | | |
| Third Avenue Bridge | 2,250 | 25 | .. | .. | .. |
| Willis Avenue Bridge | 2,507 | 35 | .. | .. | .. |
| Total | 4,757 | 70 | .. | .. | .. |
| **City Lamps on Meter Basis.** | | | | | |
| Brooklyn Bridge | 6,016 | 62 | .. | .. | .. |
| Williamsburg Bridge | 7,325 | 196 | .. | .. | .. |
| Vernon Avenue, Newtown Creek Bridge | 1,699 | .. | †14 | .. | .. |
| Total | 15,040 | 258 | 14 | .. | .. |
| **Private Lamps Supplied Free of Charge.** | | | | | |
| Second Avenue Bridge | 700 | .. | †37 | .. | .. |
| Ship Canal Bridge | 546 | .. | †80 | .. | .. |
| Total | 1,246 | .. | 117 | .. | .. |
| Total bridge lamps included in regular street Lighting | .... | 110 | 10 | 26 | 10 |
| Total bridge lamps in addition to regular street Lighting | .... | 328 | 131 | .. | .. |
| Total | 36,525 | 438 | 141 | 26 | 10 |
| Grand total, all types | | | | | 615 |

* 25 candle-power. † 16 candle-power.

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## TABLE W.

Showing Number of Outages of Electric, Gas and Naphtha Lamps, Reported by Inspectors, Police and Lighting Companies, by Boroughs and for Greater City, During the Year 1908.

| Borough. | Electric. | | Gas. | | Naphtha. | Total. |
|---|---|---|---|---|---|---|
| | Arc. | Incandescent. | Mantle. | Open Flame. | Mantle. | |
| **Manhattan.** | | | | | | |
| Inspectors | 1,180 | 31 | 17,886 | 16 | 4,091 | 23,204 |
| Police | 981 | 52 | 12,106 | .... | 1,022 | 14,161 |
| Companies | 2,277 | .... | .... | .... | .... | 2,277 |
| Total reported | 4,438 | 83 | 29,992 | 16 | 5,113 | 39,642 |
| Duplicates | 549 | 4 | 1,715 | .... | 191 | 2,459 |
| Total deducted | 3,889 | 79 | 28,277 | 16 | 4,922 | 37,183 |
| **The Bronx.** | | | | | | |
| Inspectors | 2,058 | 104 | 3,934 | 9 | 5,271 | 11,376 |
| Police | 2,707 | 52 | 3,542 | 2 | 4,739 | 11,042 |
| Companies | 1,409 | 82 | .... | .... | .... | 1,491 |
| Total reported | 6,174 | 238 | 7,476 | 11 | 10,010 | 23,909 |
| Duplicates | 349 | 13 | 214 | .... | 1,402 | 1,978 |
| Total deducted | 5,825 | 225 | 7,262 | 11 | 8,608 | 21,931 |
| **Brooklyn.** | | | | | | |
| Inspectors | 4,492 | .... | 2,406 | 54 | 409 | 7,361 |
| Police | 6,040 | .... | 1,597 | .... | 364 | 8,001 |
| Companies | .... | .... | .... | .... | .... | .... |
| Total reported | 10,532 | .... | 4,003 | 54 | 773 | 15,362 |
| Duplicates | 601 | .... | 45 | .... | 149 | 795 |
| Total deducted | 9,931 | .... | 3,958 | 54 | 624 | 14,567 |

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| Borough. | Electric. | | Gas. | | Naphtha. | Total. |
|---|---|---|---|---|---|---|
| | Arc. | Incandescent. | Mantle. | Open Flame. | Mantle. | |
| **Queens.** | | | | | | |
| Inspectors | 1,735 | 551 | 5,045 | .... | 4,772 | 12,103 |
| Police | 9,145 | 920 | 964 | .... | 76 | 11,105 |
| Companies | .... | .... | .... | .... | .... | .... |
| Total reported | 10,880 | 1,471 | 6,009 | .... | 4,848 | 23,208 |
| Duplicates | 653 | 119 | 380 | .... | 257 | 1,409 |
| Total deducted | 10,227 | 1,352 | 5,629 | .... | 4,591 | 21,799 |
| **Richmond.** | | | | | | |
| Inspectors | 638 | 4,583 | .... | .... | .... | 5,221 |
| Police | 658 | 1,364 | .... | .... | .... | 2,022 |
| Companies | .... | .... | .... | .... | .... | .... |
| Total reported and deducted. | 1,296 | 5,947 | .... | .... | .... | 7,243 |
| **Greater New York.** | | | | | | |
| Inspectors | 10,103 | 5,269 | 29,271 | 79 | 14,543 | 59,265 |
| Police | 19,531 | 2,388 | 18,209 | 2 | 6,201 | 46,331 |
| Companies | 3,686 | 82 | .... | .... | .... | 3,768 |
| Total reported | 33,320 | 7,739 | 47,480 | 81 | 20,744 | 109,364 |
| Duplicates | 2,152 | 136 | 2,354 | .... | 1,999 | 6,641 |
| Total deducted | 31,168 | 7,603 | 45,126 | 81 | 18,745 | 102,723 |

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## TABLE X.

Time Table for Lighting and Extinguishing Public Electric, Gas and Naphtha Lamps for the Year 1908—Leap Year.

| Date. | Complete Lighting in One Hour (From Time Given.) | Complete Extinguishing in 50 Minutes (From Time Given.) | Hours Per Night. | Hours Per Week. | Hours Per Month. |
|---|---|---|---|---|---|
| | p. m. | a. m. | | | |
| January 1 | 4.12 | 6.27 | 14.15 | 99.45 | |
| January 8 | 4.22 | 6.22 | 14.00 | 98.00 | |
| January 15 | 4.32 | 6.17 | 13.45 | 96.15 | |
| January 22 | 4.42 | 6.12 | 13.30 | 94.30 | |
| January 29 | 4.47 | 6.07 | 13.20 | 93.20 | |
| | | | | | 481.50 |
| February 5 | 4.57 | 6.02 | 13.05 | 91.35 | |
| February 12 | 5.07 | 5.57 | 12.50 | 51.20 (4 days) | |
| February 16 | 5.07 | 5.52 | 12.45 | 38.15 (3 days) | |
| February 19 | 5.17 | 5.47 | 12.30 | 50.00 (4 days) | |
| February 23 | 5.17 | 5.42 | 12.25 | 37.15 (3 days) | |
| February 26 | 5.22 | 5.32 | 12.10 | 60.50 (5 days) | |
| | | | | | 329.15 |
| March 2 | 5.22 | 5.27 | 12.05 | 36.15 (3 days) | |
| March 5 | 5.32 | 5.17 | 11.45 | 82.15 | |
| March 12 | 5.42 | 5.07 | 11.25 | 79.55 | |
| March 19 | 5.52 | 4.57 | 11.05 | 77.35 | |
| March 26 | 5.57 | 4.47 | 10.50 | 75.50 | |
| | | | | | 351.50 |
| April 2 | 6.07 | 4.37 | 10.30 | 42.00 (4 days) | |
| April 6 | 6.07 | 4.32 | 10.25 | 31.15 (3 days) | |
| April 9 | 6.17 | 4.22 | 10.05 | 70.35 | |
| April 16 | 6.27 | 4.17 | 9.50 | 29.30 (3 days) | |
| April 19 | 6.27 | 4.12 | 9.45 | 39.00 (4 days) | |
| April 23 | 6.37 | 4.02 | 9.25 | 65.55 | |
| April 30 | 6.47 | 3.52 | 9.05 | 63.35 | |
| | | | | | 341.50 |
| May 7 | 6.57 | 3.42 | 8.45 | 35.00 (4 days) | |
| May 11 | 6.57 | 3.37 | 8.40 | 26.00 (3 days) | |
| May 14 | 7.07 | 3.27 | 8.20 | 58.20 | |
| May 21 | 7.12 | 3.22 | 8.10 | 57.10 | |
| May 28 | 7.12 | 3.17 | 8.05 | 56.35 | |
| | | | | | 233.05 |
| June 4 | 7.17 | 3.12 | 7.55 | 55.25 | |
| June 11 | 7.17 | 3.07 | 7.50 | 54.50 | |
| June 18 | 7.22 | 3.07 | 7.45 | 54.15 | |
| June 25 | 7.27 | 3.07 | 7.40 | 53.40 | |
| | | | | | 218.10 |
| July 2 | 7.22 | 3.07 | 7.45 | 54.15 | |
| July 9 | 7.17 | 3.12 | 7.55 | 55.25 | |
| July 16 | 7.12 | 3.17 | 8.05 | 56.35 | |

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| Date. | Complete Lighting in One Hour (From Time Given.) | Complete Extinguishing in 50 Minutes (From Time Given.) | Hours Per Night. | Hours Per Week. | Hours Per Month. |
|---|---|---|---|---|---|
| | p. m. | a. m. | | | |
| July 23 | 7.07 | 3.22 | 8.15 | 57.45 | |
| July 30 | 7.02 | 3.27 | 8.25 | 58.55 | |
| | | | | | 282.55 |
| August 6 | 6.57 | 3.37 | 8.40 | 60.40 | |
| August 13 | 6.47 | 3.47 | 9.00 | 63.00 | |
| August 20 | 6.37 | 3.52 | 9.15 | 64.45 | |
| August 27 | 6.27 | 3.57 | 9.30 | 66.30 | |
| | | | | | 254.55 |
| September 3 | 6.17 | 4.07 | 9.50 | 39.20 (4 days) | |
| September 7 | 6.12 | 4.07 | 9.55 | 29.45 (3 days) | |
| September 10 | 6.02 | 4.17 | 10.15 | 71.45 | |
| September 17 | 5.52 | 4.27 | 10.35 | 42.20 (4 days) | |
| September 21 | 5.47 | 4.27 | 10.40 | 32.00 (3 days) | |
| September 24 | 5.37 | 4.37 | 11.00 | 44.00 (4 days) | |
| September 28 | 5.32 | 4.37 | 11.05 | 33.15 (3 days) | |
| | | | | | 292.25 |
| October 1 | 5.22 | 4.42 | 11.20 | 79.20 | |
| October 8 | 5.12 | 4.52 | 11.40 | 58.20 (5 days) | |
| October 13 | 5.07 | 4.52 | 11.45 | 23.30 (2 days) | |
| October 15 | 4.57 | 5.02 | 12.05 | 84.35 | |
| October 22 | 4.47 | 5.07 | 12.20 | 86.20 | |
| October 29 | 4.37 | 5.17 | 12.40 | 88.40 | |
| | | | | | 420.45 |
| November 5 | 4.27 | 5.27 | 13.00 | 91.00 | |
| November 12 | 4.17 | 5.32 | 13.15 | 92.45 | |
| November 19 | 4.12 | 5.42 | 13.30 | 94.30 | |
| November 26 | 4.07 | 5.52 | 13.45 | 96.15 | |
| | | | | | 374.30 |
| December 3 | 4.02 | 5.57 | 13.55 | 97.25 | |
| December 10 | 3.57 | 6.07 | 14.10 | 99.10 | |
| December 17 | 3.57 | 6.17 | 14.20 | 100.20 | |
| December 24 | 4.02 | 6.22 | 14.20 | 28.40 (2 days) | |
| December 26 | 4.07 | 6.22 | 14.15 | 71.15 (5 days) | |
| December 31 | 4.12 | 6.27 | 14.15 | 14.15 (1 day) | |
| | | | | | 411.05 |
| | | | | | 3,992.35 |
| Deduct on account of 50 minutes extinguishing time | | | | | 30.30 |
| Total number of hours burning | | | | | 3,962.05 |

New York, January 1, 1908.

The above time table will show the time for lighting and extinguishing public lamps for the year 1908, leap year, all lamps to be lighted within one hour from the time of beginning to light, and extinguished within fifty minutes of the time of beginning to extinguish.

JOHN H. O'BRIEN, Commissioner.

C. F. Lacombe, Chief Engineer of Light and Power.

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Prices Bid for

| Company. | | Lamp-post Straight-ened. | Column Re-leaded. | Column Re-caulked. |
|---|---|---|---|---|
| **Manhattan.** | | | | |
| Consolidated Gas Company | Bid price, 1909 | $1 50 | $2 50 | $1 00 |
| | Bid price, 1908 | 1 50 | 2 50 | 1 00 |
| New Amsterdam Gas Company | Bid price, 1909 | 1 50 | 1 50 | 1 00 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 00 |
| Standard Gas Light Company | Bid price, 1909 | 1 50 | 2 50 | 1 00 |
| | Bid price, 1908 | 1 50 | 2 50 | 1 00 |
| **The Bronx.** | | | | |
| Central Union Gas Company | Bid price, 1909 | 1 50 | 2 50 | 1 25 |
| | Bid price, 1908 | 1 50 | 2 50 | 1 25 |
| Northern Union Gas Company | Bid price, 1909 | 1 50 | 2 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 2 50 | 1 50 |
| Westchester Lighting Company | Bid price, 1909 | 2 50 | 2 50 | 1 50 |
| | Bid price, 1908 | 2 50 | 2 50 | 1 50 |
| **Brooklyn.** | | | | |
| *Brooklyn Union Gas Company | Bid price, 1909 | 1 50 | 1 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 50 |
| †Brooklyn Borough Gas Company | Bid price, 1909 | 2 50 | 2 50 | 1 50 |
| | Bid price, 1908 | No bid | No bid | No bid |
| **Queens.** | | | | |
| Newtown Gas Company | Bid price, 1909 | 1 50 | 1 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 50 |
| Richmond Hill and Queens County Gas Light Company | Bid price, 1909 | 1 50 | 1 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 50 |
| Jamaica Gas Light Company | Bid price, 1909 | 1 50 | 1 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 50 |
| Woodhaven Gas Light Company | Bid price, 1909 | 1 50 | 1 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 50 |
| New York and Queens Gas Company | Bid price, 1909 | 1 50 | 1 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 1 50 | 1 50 |
| ‡Queens Borough Gas and Electric Company | Bid price, 1909 | 1 50 | 2 50 | 1 50 |
| | Bid price, 1908 | No bid | No bid | No bid |
| **Richmond.** | | | | |
| New York and Richmond Gas Company | Bid price, 1909 | 1 50 | 2 50 | 1 50 |
| | Bid price, 1908 | 1 50 | 2 50 | 1 50 |

* Except Thirtieth and Thirty-first Wards. † Thirty-first Ward. ‡ Fifth Ward. § Per month.

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Repairs, 1909.

| Column Re-fitted. | Service Pipe Refitted. | Stand-pipe Refitted. | Lamp-post Removed. | Lamp-post Reset. | Lamp-post Reset to Grade. | Lamp-post Painted, Per Coat. | New Lamp-post Erected. | Rental of Lamp-post. | Purchase of Lamp-post. |
|---|---|---|---|---|---|---|---|---|---|
| $3 50 | $5 50 | $2 50 | $3 50 | $8 00 | $5 00 | $0 20 | $8 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 3 50 | 8 00 | 5 00 | 20 | 8 00 | .... | .... |
| 3 50 | 4 00 | 4 00 | 3 50 | No bid | 5 00 | No bid | 10 00 | .... | .... |
| 3 50 | 4 00 | 4 00 | 3 50 | No bid | 5 00 | No bid | 10 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 4 50 | 10 00 | 5 00 | No bid | 10 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 4 50 | 10 00 | 5 00 | No bid | 10 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 3 50 | 8 00 | 5 00 | 25 | 8 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 3 50 | 8 00 | 5 00 | 25 | 8 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 3 50 | No bid | 5 00 | 25 | 8 00 | .... | .... |
| 3 50 | 5 50 | 2 50 | 3 50 | No bid | 5 00 | 25 | 8 00 | .... | .... |
| 3 50 | 6 00 | 3 00 | 3 50 | 8 00 | 5 00 | 25 | 8 00 | .... | .... |
| 3 50 | 6 00 | 3 00 | 3 50 | 8 00 | 5 00 | 25 | 8 00 | .... | .... |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | .... | .... |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | .... | .... |
| 4 00 | 4 00 | 4 00 | 4 00 | 7 00 | 5 00 | 50 | 10 00 | No bid | $22 00 |
| No bid | No bid | No bid | No bid | No bid | No bid | No bid | No bid | No bid | No bid |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | No bid | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | $0 10 | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | No bid | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | $10 | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | No bid | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | $10 | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | No bid | 5 00 |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | $10 | 5 00 |
| 3 50 | 4 50 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | No bid | No bid |
| 3 50 | 4 00 | 4 00 | 3 50 | 10 00 | 5 00 | 20 | 10 00 | No bid | No bid |
| 3 50 | 8 00 | 4 00 | 5 50 | 12 50 | 5 00 | No bid | 12 50 | No bid | No bid |
| No bid | No bid | No bid | No bid | No bid | No bid | No bid | No bid | No bid | No bid |
| 3 50 | 8 00 | 4 00 | 5 00 | 12 50 | 5 00 | 30 | 12 50 | No bid | No bid |
| 3 50 | 8 00 | 4 00 | 5 00 | 12 50 | 5 00 | 30 | 12 50 | No bid | No bid |

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1909.

| ent. | | Randal Inca |
|---|---|---|
| 0 | 75 to 85 Watts. | 90 to 100 Watts. |
| . | ..... | $0 0616 |
| . | ..... | ..... |
| . | ..... | 22 50 |
| . | ..... | ..... |
| . | $0 0690 | ..... |
| . | ..... | ..... |
| . | 25 20 | ..... |
| .. | ..... | ..... |
| .. | ..... | ..... |
| .. | ..... | ..... |
| .. | ..... | ..... |
| .. | ..... | ..... |

or may be hereafter under the
plied under this contract shall nc
onsumption, 4 cents per kilowatt
year during the period of this c
to a sum less than seventeen t
. per kilowatt hour. This price
s contract, the price of all curre
current to be consumed within t
the supply of current only; care
consider necessary for this in
mpany.

or may be hereafter under the
plied under this contract shall n
onsumption, 4 cents per kilowatt
rs ($17,500) in any year during t
e reduced to a sum less than se
.2c. per kilowatt hour. This pric
s contract, the price of all curre
current to be consumed within t
the supply of current only; care
er Company may consider nece
ic Light and Power Company.

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## REPORT OF DIVISION OF RECORDS AND STREET LIGHTING INSPECTION, BOROUGHS OF MANHATTAN AND THE BRONX.

December 31, 1908.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I have the honor to submit herewith data, tables, etc., as the report of the operations of this office for the Boroughs of Manhattan and The Bronx for the year 1908

### The Inspection Service.

The force assigned to the regular inspection of public street lamps and lamp-posts during the year consisted of seventeen Inspectors in as many districts, one Inspector being assigned to each district. There were eleven districts in the Borough of Manhattan, and six in the Borough of The Bronx. The system of inspection and the method of making reports was, as far as found practicable, carried on along similar lines.

The Inspectors worked for a period of eight hours every day, four hours during the day and four hours during the night, one hour, however, being allowed them to partake of supper. As inspection districts were divided into sections, in the day time, the Inspectors examined every public lamp and lamp-post in a certain section of a district as to condition, and checked the proper performance of repairs or other work reported performed by the lighting companies, besides making any special inspection in some other part of his district required of him.

Special inspections were required for many and divers reasons; most of them, however, were made either to determine the necessity of installing new pipes in gas lamp-posts, or to supervise the proper performance of certain repairs to them, such as refitting pipes or resetting posts, or again, special inspections were made of matters requiring immediate attention and investigation.

In the night time the Inspectors traversed their entire district as far as possible, on foot and by conveyance, noting new installations reporting upon lighting conditions in general and investigating the cause of any public street lamp found improperly burning or extinguished.

During the year there were in commission in the Borough of Manhattan an average of 20,698 public electric, gas and naphtha lamps, lighting approximately upward of 449 miles of highways, and in the Borough of The Bronx, 10,799 similar lamps, lighting approximately upwards of 342 miles of highways.

The Inspectors in Manhattan reported during the year 23,204 electric, gas and naphtha outages, and 12,747 gas lamp repairs and other miscellaneous items pertaining to public lamps and lamp-posts, while in The Bronx they reported 11,376 similar outages, and 897 similar repairs and items (see Tables A, B and C, attached).

As the Inspectors personally investigated the proper performance of all work ordered on public street lamps, the three tables immediately following show in a

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condensed form the number and kind of various items pertaining to public street lighting, passed upon by them during the year.

TABLE No. 1.

| Borough. | Gas Lamp-posts Erected. | Gas Lamp-posts Removed. | Gas Lamp-post Repairs. | Gas Lamp-posts Painted. |
|---|---|---|---|---|
| Manhattan | 70 | 1,136 | 1,770 | 14,529 |
| The Bronx | 266 | 430 | 242 | 6,113 |
| Total | 336 | 1,566 | 2,012 | 20,642 |

TABLE No. 2.

New Lamps Lighted.

| Borough. | Arc. | Incandescent. | Mantle Gas. | Open Flame Gas. | Mantle Naphtha. | Total. |
|---|---|---|---|---|---|---|
| Manhattan | 530 | 373 | 71 | .. | .. | 974 |
| The Bronx | 144 | 142 | 285 | .. | 35 | 606 |
| Total | 674 | 515 | 356 | .. | 35 | 1,580 |

Lamps Relighted.

| Borough. | Arc. | Incandescent. | Mantle Gas. | Open Flame Gas. | Mantle Naphtha. | Total. |
|---|---|---|---|---|---|---|
| Manhattan | 3 | 2 | 538 | 30 | 10 | 583 |
| The Bronx | 18 | 369 | 100 | .. | 14 | 501 |
| Total | 21 | 371 | 638 | 30 | 24 | 1,084 |

Lamps Discontinued.

| Borough. | Arc. | Incandescent. | Mantle Gas. | Open Flame Gas. | Mantle Naphtha. | Total. |
|---|---|---|---|---|---|---|
| Manhattan | 4 | 2 | 1,345 | 65 | 267 | 1,683 |
| The Bronx | 25 | 370 | 174 | 2 | 149 | 720 |
| Total | 29 | 372 | 1,519 | 67 | 416 | 2,403 |

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TABLE No. 3.

| Borough. | Arc Lamps. | | Incandescent. | Naphtha Lamps. | | | Total. |
|---|---|---|---|---|---|---|---|
| | Removed and Reset. | Reset. | Removed and Reset. | Removed and Reset. | Reset. | Straightened. | |
| Manhattan | 78 | 4 | .. | 4 | .. | .. | 86 |
| The Bronx | 157 | 3 | 5 | 19 | 4 | 5 | 193 |
| Total | 235 | 7 | 5 | 23 | 4 | 5 | 279 |

The Inspectors during the year have become more familiar with the locations of the lamps and the lighting conditions in their respective districts. Lamps discontinued on account of repairs were left out of service as short a time as possible, as strict observance to the rule of having such lamps repaired and relighted as early as possible, has always been insisted upon and borne in the minds of the Inspectors. The consequence was that a very few complaints of the lighting service were received during the year.

Persons who erected scaffolds, bridges, etc., over sidewalks in the streets, that interfered with the proper diffusion of light from public street lamps, were, as far as in our power, compelled to furnish sufficient lighting at such places to make it safe for travel, at their own expense. Inspectors kept close watch on these places, and reported regularly upon the same. They also acted similarly in relation to places where construction work of any kind near a public street lamp or lamp-post was in progress, in order that the safety of said lamp or lamp-post was not endangered in any way.

For two days, about the end of every month, the Inspectors were obliged to give up the inspection of street lamps, to read the gas and electric meters in all public buildings in a certain district assigned each of them.

Outages—In Table D, hereto attached, a comparison is made in the number of outages reported by the Inspectors of this Department, by the Police, and by the lighting companies.

As regards electric lamp outages, special mention need only be made of those charged against the New York Edison Company for the Edison and the Bronx districts, and for the United district of said company, as this was the only electric lighting company to submit schedules of outages found by its Inspectors during 1908. It will be noted that this company reported 3,686 outages in their Edison, Bronx and United districts combined, while our Inspectors reported 1,879 outages, and the Police 1,129 outages, in the same districts. While, at first sight, these figures do not appear to make a creditable showing for our Inspectors, a few words of explanation must be made in regard to the same. At the very outset, the Department Inspectors work for a period of but three hours at night, beginning their inspection immediately after all

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public street lamps are supposed to have been lighted, and not only must be vigilant for electric lamp outages, but for gas and naphtha lamp outages as well; often times also making special inspections. This is not the case with the lighting company. It is reported by them that they receive reports from fifteen of their inspectors who work throughout the night while lamps are supposed to be burning, and from eighty-seven lamplighters who light the lamps at night and extinguish them in the morning. With this force, a system of inspection has been so arranged by this company that every lamp maintained by it is seen five times every night. Our force for these same districts consisted of fifteen Inspectors, and in most cases the lamps reported as not burning were seen by them only once during their night tour. Furthermore, consideration must be given the fact that a great many of the outages reported by the Police and lighting company were found after our Inspectors had finished their work, i. e., after their three-hour night tour, and it must also be borne in mind that as an electric lamp may, from various causes, at any time become extinguished, and afterward relight itself during the night, it is therefore possible at times for such a lamp to become extinguished for a short time, even when our Inspector is on duty, and still escape being detected by him. Nevertheless, our Inspectors reported 750 more electric lamp outages for the above districts during the year than the Police.

As regards the gas and naphtha lamp outages, reports for these were submitted only by our Inspectors and the Police. In Manhattan and The Bronx, our seventeen Inspectors reported 21,845 gas and 9,362 naphtha lamp outages, while the Police for these Boroughs reported 15,650 and 5,761 similar outages, or in other words, 6,195 gas and 3,601 naphtha lamp outages less than the number reported by our Inspectors.

The good showing made by the Inspectors in regard to the gas and naphtha outages is due to the fact that either of these lamps when the same become extinguished, usually do so soon after being lighted by the lamplighter, and are thereafter extinguished for the entire night, and if the Inspector is really vigilant for lamp outages cannot but help to locate these extinguishments.

In conclusion it can be said that the street lighting service in Manhattan and The Bronx has reached a higher degree of efficiency during the past year than heretofore, as may be deduced from reports received in this office from the many and varied sources.

Repairs to Gas Lamp-posts.

During 1908, as is shown on Table E hereto attached, there was performed by the Consolidated Gas Company 1,770 repairs to gas lamp-posts in Manhattan, and 242 repairs in The Bronx. These repairs were ordered only after a personal inspection of the lamp-posts affected had been made by our Inspectors, who reported the same as being absolutely necessary.

In addition to the above, 1,136 gas lamp-posts were removed in Manhattan, and 430 in The Bronx. Of those removed in Manhattan, 208 were found broken, while in The Bronx only 10 were found broken.

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Economy in the ordering of repairs was practiced, and to this end where a lamp-post had been broken or caused to become in need of repairs through fault of any person, an endeavor was made to have the responsible person defray whatever expense the City had been put to. Attention is therefore called to Table G, which shows in detail claims collected during the year for damages to public gas lamp-posts, the same amounting to the sum of $368.60, and to Tables H, I and J, which show the following repairs as having been performed at the expense of private persons in Manhattan and The Bronx:

10 lamp-posts removed and 2 reset.

2 lamp-posts removed and 2 brackets erected.

6 lamp-posts removed.

5 lamp-posts reset.

2 lamp-posts straightened.

11 columns refitted to lamp-posts.

## The Workings of the Office.

During the year there were 555 lighting orders and 680 repair orders sent to the various gas and electric lighting companies in the Boroughs of Manhattan and The Bronx.

The work performed on these orders involved the installation of 1,580 new electric, gas and naphtha lamps; the relighting of 1,984, and the discontinuance of 2,403 similar lamps; the erection of 336, and the removal of 1,566 gas lamp-posts, the performance of 2,012 repairs to gas lamp-posts, and the painting of all the gas lamp-posts then in commission, numbering 20,642. In addition to the above work there were 279 electric and naphtha lamp-posts relocated and otherwise repaired on said orders.

All of these items appeared on the regular monthly bills submitted by the gas and electric light companies, which, before being audited, were duly passed up and checked by our Inspectors, and then rechecked in the records of this office.

The daily and weekly reports of the gas lighting companies, showing changes in the lighting service, were also likewise checked.

Tables B, C and D, hereto attached, show the number and kind of outages reported by our Inspectors, the Police and the lighting companies during the year. To reach the figures given therein, a careful comparison of all extinguishment reports received was necessary in order that a duplicate charge might not have been made for the same extinguishment. The work was somewhat intricate, considering the different ways the location of a lamp was given, aside from the fact that Inspectors made reports daily; the Police, weekly, and the lighting companies, monthly. These reports have all been carefully filed away and can be had for reference on short notice.

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The daily reports of tests conducted under the supervision of the Chief Gas Examiner, at the twelve photometric stations of the Greater City were also carefully filed in this office, and are now part of the Bureau records.

The regular weekly report of work done on public lamps and lamp posts in the Boroughs of Manhattan and The Bronx, as required by the provisions of section 1546 of The Greater New York Charter, were compiled and duly transmitted to the Commissioner of this Department.

All work of a routine character in the Borough of The Bronx was conducted and disposed of by General Inspector H. F. McLaughlin, who was in charge of the office and the Inspectors in said Borough, while all other matters, such as requests for and complaints of lighting, and the more detailed work required in the checking of lighting companies' bills, were handled through this office, after having received the attention of the said General Inspector in the regular way. On account of the steadily increasing business of this office, however, it was deemed advisable to appoint and assign a stenographer and typewritist in The Bronx, and this was done in November, 1908.

The office force in the Borough of Manhattan during the year consisted of five men doing clerical work, and a Stenographer and Typewritist.

The work of this office, however, has materially increased during the past year, as through it were handled many and more reports, correspondence and other matters, concerning the other Boroughs of the City, than heretofore, and judging from existing conditions, which cannot but continue, it is necessary, in order to properly conduct the business at this office during the coming year, that an additional clerk be assigned to it as early as possible.

In conclusion, I have to state that the Office Assistants, as well as the Inspectors under me, have done very commendable work.

## Description of Tables.

Table A shows in a condensed form the number of repairs and various other items pertaining to public street lamps and street signs reported by Inspectors in the Boroughs of Manhattan and The Bronx, notices of which were duly transmitted to the respective lighting companies and the Borough President. It also gives the number of incumbrances reported and removed by the Department Expressman.

Table AA shows the miscellaneous items affecting public street lamps and lamp-posts in the Boroughs of Manhattan and The Bronx reported by Inspectors, and number of notices sent various persons regarding same during the year 1908.

Table B shows the net number of electric, gas and naphtha lamp outages reported each month of 1908 by our Inspectors, the Police and the lighting companies in Manhattan, and the lighting companies against whom the outages were charged.

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Table C, same as Table B, but for the Borough of The Bronx.

Table D shows a comparison and the number of electric, gas and naphtha lamp outages reported by our Inspectors, by the Police and by the lighting companies in the Boroughs of Manhattan and The Bronx during the year. It also gives the total number of outages reported of the different types of public street lamps, the number of duplicates and the net number of outages, besides the average numbr of lamps burning and the mileage of lighted streets.

Table E shows the number of gas lampposts erected, removed, painted and repaired, by the lighting companies in the Borough of Manhattan and The Bronx during 1908.

Table F shows in detail the disposition made of certain lamp material during the year, and material on hand December 31, 1908, a record of all of which was kept in our supply ledger.

Table G shows claims collected in 1908 from certain persons for damages done to public gas lampposts. These claims were all satisfied by said persons, after having communicated with them regarding their responsibility for said damage. Of the twenty-seven claims collected, mentioned in this table, the same included the cost of eighteen lampposts and one ornamental bracket which had been broken.

Table H shows repairs performed in 1908 to various public gas lampposts in the Borough of Manhattan, at the expense of certain private persons. Repairs were charged to these persons as their performance involved a convenience of some kind to them, as well as being necessary for the safety of the lamppost.

Table I, same as Table H, but for the Borough of The Bronx.

Table J is a summary of the number and kind of repairs given in Tables H and I.

Table K gives the locations of the new ornamental fire alarm signals and lampposts, erected by the Fire Department, in the Borough of Manhattan, in commission December 31, 1908.

Table L gives the names of the persons to whom permits were granted during 1908 for the erection and maintenance at their own cost and expense of certain private lamps on public highways in the Borough of Manhattan. As can be noted, permission was given for the installation of one mantle gas lamp, one electric arc lamp, and three incandescent electric lamps.

All of which is respectfully submitted.

PRIMO PORCELLA, General Inspector.

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TABLE

Number and Kind of Repairs to Public Street Lamps Reported Necessary by

| Company and Borough. | Lamps. |
|---|---|
| Welsbach Street Lighting Company of America— | |
| Manhattan | 43 |
| The Bronx | 6 |
| Total | 49 |

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A.

Inspectors During the Year 1908, in the Boroughs of Manhattan and The Bronx.

| Mantle Gas Lamps—Refit. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ventilators. | Domes. | Globes. | Chimneys. | Mantles. | Burners. | Lamp-irons. | Cross-heads. | Total. |
| 222 | 1,493 | 2,977 | 296 | 4,391 | 57 | 239 | 74 | 9,792 |
| .. | 101 | 276 | .. | 390 | .. | .. | .. | 773 |
| 222 | 1,594 | 3,253 | 296 | 4,781 | 57 | 239 | 74 | 10,565 |

## TABLE AA.

Miscellaneous Items Affecting Public Street Lamps and Lamp-posts in the Boroughs of Manhattan and The Bronx, Reported by Inspectors, and Number of Notices Sent Various Persons Regarding Same, During the Year 1908.

| Item. | Number of Notices. Manhattan. | The Bronx. | To Whom Sent. |
|---|---|---|---|
| Broken globes of electric arc lamps | 58 | 88 | New York Edison Company. |
| Defective light of electric arc lamps | 18 | 36 | New York Edison Company. |
| Clean globes of mantle gas lamps | 109 | .. | Welsbach Street Lighting Company of America. |
| Clear pipes of lamp-posts with force pump | 856 | .. | Consolidated Gas Company. |
| Broken or missing street signs. | 1,471 | .. | Borough President. |
| Remove incumbrances from lamp-posts | 443 | .. | Departmental Expressman. |
| Total miscellaneous items | 2,955 | 124 | |
| Total gas lamp repairs | 9,792 | 773 | |
| Grand total | 12,747 | 897 | |

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TABLE

Statement Showing the Net Number of Electric, Gas and Naphtha Extinguishments Month During the Year 1908,

| Company. | January. | February. | March. | April. |
|---|---|---|---|---|
| **Electric Arc Lamps.** | | | | |
| New York Edison Company— | | | | |
| Edison District | 309 | 262 | 259 | 161 |
| United District | 55 | 105 | 57 | 104 |
| Total arc | 364 | 367 | 316 | 265 |
| **Electric Incandescent Lamps.** | | | | |
| New York Edison Company | .... | 1 | .... | 4 |
| United Electric Light and Power Company | .... | .... | .... | .... |
| Total incandescent | .... | 1 | .... | 4 |
| Total arc | 364 | 367 | 316 | 265 |
| Total incandescent | .... | 1 | .... | 4 |
| Total electric | 364 | 368 | 316 | 269 |
| **Gas Lamps.** | | | | |
| Welsbach Street Lighting Company of America— | | | | |
| Mantle | 2,415 | 5,971 | 2,323 | 2,253 |
| Open flame | 6 | .... | .... | 1 |
| Total gas | 2,421 | 5,971 | 2,323 | 2,254 |
| **Naphtha Lamps.** | | | | |
| Welsbach Street Lighting Company of America— | | | | |
| Mantle | 449 | 238 | 401 | 512 |
| Total naphtha | 449 | 238 | 401 | 512 |
| **Extinguishments.** | | | | |
| Total electric lamps | 364 | 368 | 316 | 269 |
| Total gas lamps | 2,421 | 5,971 | 2,323 | 2,254 |
| Total naphtha lamps | 449 | 238 | 401 | 512 |
| Grand total | 3,234 | 6,577 | 3,040 | 3,035 |

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B.

Reported by Department Inspectors, the Police and the Lighting Companies Each in the Borough of Manhattan.

| May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|
| 167 | 143 | 149 | 203 | 171 | 223 | 253 | 313 | 2,613 |
| 111 | 57 | 202 | 97 | 106 | 70 | 75 | 237 | 1,276 |
| 278 | 200 | 351 | 300 | 277 | 293 | 328 | 550 | 3,889 |
| 2 | .... | .... | .... | .... | 2 | 2 | 10 | 21 |
| .... | .... | .... | .... | .... | .... | .... | 58 | 58 |
| 2 | .... | .... | .... | .... | 2 | 2 | 68 | 79 |
| 278 | 200 | 351 | 300 | 277 | 293 | 328 | 550 | 3,889 |
| 2 | .... | .... | .... | .... | 2 | 2 | 68 | 79 |
| 280 | 200 | 351 | 300 | 277 | 295 | 330 | 618 | 3,968 |
| 1,643 | 1,586 | 1,355 | 2,703 | 2,241 | 2,099 | 1,870 | 1,818 | 28,277 |
| .... | .... | .... | .... | 3 | 3 | 1 | 2 | 16 |
| 1,643 | 1,586 | 1,355 | 2,703 | 2,244 | 2,102 | 1,871 | 1,820 | 28,293 |
| 510 | 234 | 301 | 595 | 776 | 363 | 300 | 243 | 4,922 |
| 510 | 234 | 301 | 595 | 776 | 363 | 300 | 243 | 4,922 |
| 280 | 200 | 351 | 300 | 277 | 295 | 330 | 618 | 3,968 |
| 1,643 | 1,586 | 1,355 | 2,703 | 2,244 | 2,102 | 1,871 | 1,820 | 28,293 |
| 510 | 234 | 301 | 595 | 776 | 363 | 300 | 243 | 4,922 |
| 2,433 | 2,020 | 2,007 | 3,598 | 3,297 | 2,760 | 2,501 | 2,681 | 37,183 |

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TABLE

Statement Showing the Net Number of Electric, Gas and Naphtha Extinguishments Month During the Year 1908,

| Company. | January. | February. | March. | April. |
|---|---|---|---|---|
| Electric Arc Lamps. | | | | |
| New York Edison Company— | | | | |
| The Bronx District | 424 | 246 | 205 | 196 |
| Westchester District | 168 | 81 | 35 | 219 |
| Bronx Gas and Electric Company | 11 | 24 | 11 | 70 |
| Total arc | 603 | 351 | 251 | 485 |
| Electric Incandescent Lamps. | | | | |
| New York Edison Company | 16 | 10 | 10 | 7 |
| Westchester Lighting ompany | .... | 4 | .... | 30 |
| Bronx Gas and Electric Company | .... | .... | .... | .... |
| Total incandescent | 16 | 14 | 10 | 37 |
| Total arc | 603 | 351 | 251 | 485 |
| Total incandescent | 16 | 14 | 10 | 37 |
| Total electric | 619 | 365 | 261 | 522 |
| Gas Lamps. | | | | |
| Welsbach Street Lighting Company of America— | | | | |
| Mantle | 557 | 944 | 390 | 290 |
| Open flame | 2 | 1 | .... | .... |
| Total gas | 559 | 945 | 390 | 290 |
| Naphtha Lamps. | | | | |
| Welsbach Street Lighting Company of America— | | | | |
| Mantle | 419 | 458 | 222 | 203 |
| Total naphtha | 419 | 458 | 222 | 203 |
| Extinguishments. | | | | |
| Total electric lamps | 619 | 365 | 261 | 522 |
| Total gas lamps | 559 | 945 | 390 | 290 |
| Total naphtha lamps | 419 | 458 | 222 | 203 |
| Grand total | 1,597 | 1,768 | 873 | 1,015 |

Recapitu

| Company. | January. | February. | March. | April. |
|---|---|---|---|---|
| Manhattan, grand total extinguishments | 3,234 | 6,577 | 3,040 | 3 035 |
| The Bronx, grand total extinguishments | 1,597 | 1,768 | 873 | 1,015 |
| Grand total | 4,831 | 8,345 | 3,913 | 4,050 |

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C.

Reported by Department Inspectors, the Police and the Lighting Companies Each in the Borough of The Bronx.

| May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|
| 157 | 81 | 152 | 75 | 73 | 104 | 118 | 209 | 2,040 |
| 427 | 83 | 158 | 90 | 595 | 361 | 149 | 317 | 2,683 |
| 164 | 23 | 42 | 49 | 79 | 420 | 151 | 58 | 1,102 |
| 748 | 187 | 352 | 214 | 747 | 885 | 418 | 584 | 5,825 |
| 10 | 7 | 3 | 10 | 9 | 5 | 4 | 6 | 97 |
| 4 | 3 | 20 | .... | 27 | 11 | 1 | 4 | 104 |
| .... | .... | .... | .... | 5 | 6 | 7 | 6 | 24 |
| 14 | 10 | 23 | 10 | 41 | 22 | 12 | 16 | 225 |
| 748 | 187 | 352 | 214 | 747 | 885 | 418 | 584 | 5,825 |
| 14 | 10 | 23 | 10 | 41 | 22 | 12 | 16 | 225 |
| 762 | 197 | 375 | 224 | 788 | 907 | 430 | 600 | 6,050 |
| 312 | 189 | 212 | 2,300 | 1,031 | 358 | 326 | 353 | 7,262 |
| 1 | .... | .... | .... | 1 | 2 | .... | 4 | 11 |
| 313 | 189 | 212 | 2,300 | 1,032 | 360 | 326 | 357 | 7,273 |
| 175 | 165 | 177 | 4,444 | 1,667 | 298 | 168 | 212 | 8,608 |
| 175 | 165 | 177 | 4,444 | 1,667 | 298 | 168 | 212 | 8,608 |
| 762 | 197 | 375 | 224 | 788 | 907 | 430 | 600 | 6,050 |
| 313 | 189 | 212 | 2,300 | 1,032 | 360 | 326 | 357 | 7,273 |
| 175 | 165 | 177 | 4,444 | 1,667 | 298 | 168 | 212 | 8,608 |
| 1,250 | 551 | 764 | 6,968 | 3,487 | 1,565 | 924 | 1,169 | 21,931 |

lation.

| May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|
| 2,433 | 2,020 | 2,007 | 3,598 | 3,297 | 2 760 | 2,501 | 2,681 | 37,183 |
| 1,250 | 551 | 764 | 6,968 | 3,487 | 1,565 | 924 | 1,169 | 21,931 |
| 3,683 | 2,571 | 2,771 | 10,566 | 6,784 | 4,325 | 3,425 | 3,850 | 59,114 |

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TABLE

Comparative Statement Showing the Number of Electric, Gas and Naphtha Lamp Average Number of Lamps Burning and Mileage of Streets Lighted,

| Company and Borough. | Reported by Inspectors. |
|---|---|
| **Electric Arc Lamps.** | |
| New York Edison Company— | |
| Edison District | 615 |
| United District | 565 |
| Manhattan arcs | 1,180 |
| New York Edison Company— | |
| The Bronx District | 697 |
| Westchester District | 674 |
| Bronx Gas and Electric Company | 687 |
| The Bronx arcs | 2,058 |
| Manhattan arcs | 1,180 |
| The Bronx arcs | 2,058 |
| Total arcs | 3,238 |
| **Electric Incandescent Lamps.** | |
| New York Edison Company | 19 |
| United Electric Light and Power Company | 12 |
| Manhattan incandescents | 31 |
| New York Edison Company | 10 |
| Westchester Lighting Company | 70 |
| Bronx Gas and Electric Company | 24 |
| The Bronx incandescents | 104 |
| Manhattan incandescents | 31 |
| The Bronx incandescents | 104 |
| Total incandescents | 135 |
| Total arcs | 3,238 |
| Total incandescents | 135 |
| Total electrics | 3,373 |

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D.

Outages Reported by Our Inspectors, the Police and the Lighting Companies, During the Year 1908, in the Boroughs of Manhattan and The Bronx.

| Reported by Police. | Reported by Companies. | Total Reported. | Deducted as Duplicate. | Net Number of Outages. | Average Number Lamps Burning. | Mileage of Streets Lighted December 31, 1908. | |
|---|---|---|---|---|---|---|---|
| | | | | | | Miles. | Feet. |
| 827 | 1,538 | 2,980 | 367 | 2,613 | 3,831 | .... | .... |
| 154 | 739 | 1,458 | 182 | 1,276 | 283 | .... | .... |
| 981 | 2,277 | 4,438 | 549 | 3,889 | 4,114 | 198 | 922 |
| 148 | 1,409 | 2,254 | 214 | 2,040 | 1,333 | .... | .... |
| 2,133 | .... | 2,807 | 124 | 2,683 | 263 | .... | .... |
| 426 | .... | 1,113 | 11 | 1,102 | 769 | .... | .... |
| 2,707 | 1,409 | 6,174 | 349 | 5,825 | 2,365 | 149 | 2,285 |
| 981 | 2,277 | 4,438 | 549 | 3,889 | 4,114 | .... | .... |
| 2,707 | 1,409 | 6,174 | 349 | 5,825 | 2,365 | .... | .... |
| 3,688 | 3,686 | 10,612 | 898 | 9,714 | 6,479 | 347 | 3,207 |
| 4 | .... | 23 | 2 | 21 | 166 | .... | .... |
| 48 | .... | 60 | 2 | 58 | 11 | .... | .... |
| 52 | .... | 83 | 4 | 79 | 177 | 2 | 2,833 |
| 6 | 82 | 98 | 1 | 97 | 381 | .... | .... |
| 46 | .... | 116 | 12 | 104 | 16 | .... | .... |
| .... | .... | 24 | .... | 24 | 21 | .... | .... |
| 52 | 82 | 238 | 13 | 225 | 418 | 14 | 2,685 |
| 52 | .... | 83 | 4 | 79 | 177 | .... | .... |
| 52 | 82 | 238 | 13 | 225 | 418 | .... | .... |
| 104 | 82 | 321 | 17 | 304 | 595 | 17 | 238 |
| 3,688 | 3,686 | 10,612 | 898 | 9,714 | 6,479 | 347 | 3,207 |
| 104 | 82 | 321 | 17 | 304 | 595 | 17 | 238 |
| 3,792 | 3,768 | 10,933 | 915 | 10,018 | 7,074 | 364 | 3,445 |

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| Company and Borough. | Reported by Inspectors. |
|---|---|
| **Gas Lamps.** | |
| Welsbach Street Lighting Company of America— | |
| Manhattan | 17,902 |
| The Bronx | 3,943 |
| Total gas | 21,845 |
| **Naphtha Lamps.** | |
| Welsbach Street Lighting Company of America— | |
| Manhattan | 4,091 |
| The Bronx | 5.271 |
| Total naphtha | 9,362 |

Recapit

| Company and Borough. | Reported by Inspectors. |
|---|---|
| Total electric lamps | 3,373 |
| Total gas lamps | 21,845 |
| Total naphtha lamps | 9,362 |
| Grand total | 34,580 |

TABLE

Work Performed by Lighting Company to Gas Lamp-posts During

| Company and Borough. | Total Number of Repairs. | Erected. | | Lamp-posts Removed. | Lamp-posts Painted. |
|---|---|---|---|---|---|
| | | Lamp-posts. | Brackets. | | |
| Consolidated Gas Company, Manhattan | 1,770 | 68 | 2 | 1,136 | 14,529 |
| Consolidated Gas Company, The Bronx | 242 | 266 | .. | 430 | 6,113 |
| Total for Manhattan and The Bronx. | 2,012 | 334 | 2 | 1,566 | 20,642 |

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| Reported by Police. | Reported by Companies. | Total Reported. | Deducted as Duplicate. | Net Number of Outages. | Average Number Lamps Burning. | Mileage of Streets Lighted December 31, 1908. | |
|---|---|---|---|---|---|---|---|
| | | | | | | Miles. | Feet. |
| 12,106 | .... | 30,008 | 1,715 | 28,293 | 15,313 | 244 | 1,184 |
| 3,544 | .... | 7,487 | 214 | 7,273 | 6,134 | 136 | 4,697 |
| 15,650 | .... | 37,495 | 1,929 | 35,566 | 21,447 | 381 | 601 |
| 1,022 | .... | 5,113 | 191 | 4,922 | 1,094 | 4 | 2,655 |
| 4,739 | .... | 10,010 | 1,402 | 8,608 | 1,882 | 41 | 3,653 |
| 5,761 | .... | 15,123 | 1,593 | 13,530 | 2,976 | 46 | 1,028 |

ulation.

| Reported by Police. | Reported by Companies. | Total Reported. | Deducted as Duplicate. | Net Number of Outages. | Average Number Lamps Burning. | Mileage of Streets Lighted December 31, 1908. | |
|---|---|---|---|---|---|---|---|
| | | | | | | Miles. | Feet. |
| 3,792 | 3,768 | 10,933 | 915 | 10,018 | 7,074 | 364 | 3,445 |
| 15,650 | .... | 37,495 | 1,929 | 35,566 | 21,447 | 381 | 601 |
| 5,761 | .... | 15,123 | 1,593 | 13,530 | 2,976 | 46 | 1,028 |
| 25,203 | 3,768 | 63,551 | 4,437 | 59,114 | 31,497 | 791 | 5,074 |

E.

the Year 1908, in the Boroughs of Manhattan and The Bronx.

| Number and Kind of Repairs. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Lamp-posts Reset | Lamp-posts Reset to Grade | Lamp-posts Straight-ened. | Refitted. | | Columns Releaded. | Columns Recaulked. | Service pipe Refitted. | Stand-pipe Refitted. |
| | | | Columns. | Brackets. | | | | |
| 238 | 64 | 479 | 56 | 13 | 328 | 196 | 196 | 200 |
| 83 | 2 | 37 | 7 | .. | 7 | 1 | 60 | 45 |
| 321 | 66 | 516 | 63 | 13 | 335 | 197 | 256 | 245 |

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TABLE

Inventory of the Disposition of Supplies for Repairs

| | On Hand in Department Storehouse and Corporation Yard, December 31, 1907. | Material Given to Lighting Companies During the Year. | |
|---|---|---|---|
| | | Manhattan. | Brooklyn. |
| Boulevard globes | 655 | .... | .... |
| Boulevard tops | 326 | .... | .... |
| Boulevard reflectors | 450 | .... | .... |
| Boulevard band globes | 3 | .... | .... |
| Bridge globes | 10 | .... | .... |
| Bridge tops | 37 | .... | .... |
| Bridge reflectors | 35 | .... | .... |
| Brackets, single prong | 17 | 6 | .... |
| Brackets, double prong | 7 | 4 | .... |
| Brackets, flange | 2 | .... | .... |
| Brackets, transverse road | 24 | 4 | .... |
| Brackets, transverse road (old) | 1 | .... | .... |
| Crossheads, boulevard | 3 | .... | .... |
| Crossheads, corporation | 1,310 | .... | .... |
| Crossheads, empire | 98 | .... | .... |
| Fire alarm lamps | 13 | .... | .... |
| Fire alarm signs | 49 | .... | .... |
| Fire alarm glasses (small segments), sets | 299 | .... | 12 |
| Fire alarm glasses (large segments), sets | 674 | .... | 12 |
| Fire alarm glasses, large size sets | 798 | 450 | .... |
| Lamp-irons, boulevard | 210 | .... | .... |
| Lamp-irons, square | 356 | .... | .... |
| Lamp-posts, corporation butts of (sub base style) | 2 | .... | .... |
| Lamp-posts, corporation butts of (flange style) | .... | .... | .... |
| Lamp-posts, corporation columns of | .... | .... | .... |
| Lamp-posts, corporation (sub-base style) | 187 | .... | .... |
| Lamp-posts, corporation (flange style) | 32 | .... | .... |
| Lamp-posts, boulevard | .... | †297 | .... |
| Lamp-posts, empire (sub-base style) | 68 | 2 | 2 |
| Lamp-posts, empire (flange style) | 8 | 4 | .... |
| Lamp-posts, ornamental | 1 | .... | .... |
| Minor globes, green | 1 | .... | .... |
| Minor globes, plain | 163 | .... | .... |
| Minor lamps | 100 | .... | .... |
| Police globes, boulevard size | 101 | 10 | 12 |
| Police globes, bridge size | 3 | .... | .... |
| Square lanterns | 57 | 6 | .... |
| Viaduct lamps | 7 | .... | .... |

Total value of material on hand December 31, 1908.....

Department storehouse, No. 31 Perry street.

Corporation yard, foot of West Fifty-sixth street.

* Old.

† Taken down from streets and immediately delivered to New York Edison Company in con

‡ Included in cost for Empire lamp-posts.

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F.

to Public Gas Lamps and Lamp-posts During the Year 1908.

| Material on Hand December 31, 1908. | | | | | | | |
|---|---|---|---|---|---|---|---|
| In Department Storehouse and Corporation Yard. | In Storehouse of Welsbach Street Lighting Company of America. | In Consolidated Gas Company's Storeyard. | In Northern Union Gas Company's Storeyard. | In Central Union Gas Company's Storeyard. | Total Number of Pieces. | Value. Per Piece. | Value. Per Item. |
| 655 | .... | 1 | .... | .... | 656 | $0 74 | $485 44 |
| 326 | .... | 12 | .... | .... | 638 | 86 | 548 68 |
| 450 | .... | 18 | .... | .... | 468 | 29 | 135 72 |
| 3 | .... | .... | .... | .... | 3 | 1 12 | 3 36 |
| 10 | .... | .... | .... | .... | 10 | 74 | 7 40 |
| 37 | .... | .... | .... | .... | 37 | 86 | 31 82 |
| 35 | .... | .... | .... | .... | 35 | 33 | 11 55 |
| 11 | .... | .... | .... | .... | 11 | 1 00 | 11 00 |
| 3 | .... | .... | .... | .... | 3 | 1 40 | 4 20 |
| 2 | .... | .... | .... | .... | 2 | 1 00 | 2 00 |
| 20 | .... | .... | .... | .... | 20 | 9 00 | 180 00 |
| 1 | .... | 5 | .... | .... | 6 | 3 50 | 21 00 |
| 3 | .... | .... | .... | .... | 3 | 24 | 72 |
| 1,310 | .... | 260 | .... | .... | 1,570 | 18 | 282 60 |
| 98 | .... | .... | .... | .... | 98+ | .... | .... |
| 13 | .... | *19 | .... | .... | 32 | 2 62 | 83 84 |
| 49 | .... | .... | .... | .... | 49 | 35 | 17 15 |
| 287 | .... | .... | .... | .... | 287 | 40 | 114 80 |
| 662 | .... | .... | .... | .... | 662 | 1 25 | 827 50 |
| 348 | 100 | .... | .... | .... | 448 | 1 24 | 555 52 |
| 210 | .... | 318 | .... | .... | 528 | 34 | 179 52 |
| 356 | .... | 247 | .... | .... | 603 | 36 | 217 08 |
| 2 | .... | .... | 7 | 30 | 39 | 5 03 | 196 17 |
| .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | 494 | .... | .... | 494 | 1 50 | 741 00 |
| 187 | .... | 662 | 7 | 3 | 859 | 6 53 | 5,609 27 |
| 32 | .... | 20 | .... | .... | 52 | 6 53 | 339 56 |
| .... | .... | 210 | .... | .... | 210 | 7 00 | 1,470 00 |
| 64 | .... | .... | .... | .... | 64 | 20 00 | 1,280 00 |
| 4 | .... | .... | .... | .... | 4 | 20 00 | 80 00 |
| 1 | .... | .... | .... | .... | 1 | 7 50 | 7 50 |
| 1 | .... | .... | .... | .... | 1 | 1 50 | 1 50 |
| 163 | .... | 7 | .... | .... | 170 | 45 | 76 50 |
| 100 | .... | .... | .... | .... | 100 | 2 47 | 247 00 |
| 79 | .... | 1 | .... | .... | 80 | 4 19 | 335 20 |
| 3 | .... | .... | .... | .... | 3 | 2 00 | 6 00 |
| 51 | .... | .... | .... | .... | 51 | 1 67 | 85 17 |
| 7 | .... | .... | .... | .... | 7 | 6 75 | 47 25 |
| ..... | | | | | | | $14,243 02 |

nection with Tungsten Lamp Installation.

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TABLE

The following schedule shows claims collected during the year 1908 by the Depart a result of damage done to lamp-posts by said persons or their representatives:

| Date. | Location of Post. |
|---|---|
| Jan. 17 | Forty-seventh street, south side, 2 east of Eighth avenue |
| Jan. 30 | Eighth avenue, northeast corner Fifty-sixth street |
| Jan. 30 | Broadway, west side, 1 and 2 north of One Hundred and Seventieth street |
| Mar. 2 | Park avenue, northeast corner of Seventy-eighth street |
| Mar. 17 | Broadway, northwest corner of Warren street |
| Mar. 19 | Thirty-sixth street, southwest corner of Third avenue |
| Mar. 21 | Thirty-eighth street, south side, 3 east of Eighth avenue |
| Mar. 21 | Thirty-eighth street, north side, 2 east of Tenth avenue |
| Mar. 23 | Amsterdam avenue, northwest corner of One Hundredth street |
| Mar. 24 | St. Nicholas avenue, east side, 1 north of One Hundred and Fifty-sixth street |
| Mar. 24 | Fifty-fifth street, north side, 2 east of First avenue |
| Mar. 25 | No. 116 East Sixty-third street |
| May 16 | Eighty-sixth street and transverse road, lamp No. 15 |
| June 15 | Fifth avenue, southeast corner of One Hundred and Eighth street |
| June 19 | One Hundred and Fourteenth street, south side, 1 east of Riverside drive |
| Aug. 18 | Sixty-eighth street, north side, 1 east of Amsterdam avenue |
| Aug. 19 | One Hundred and Twenty-fifth street, south side, 2 east of Amsterdam avenue |
| Aug. 19 | Broadway, west side, 1 north of Eighty-ninth street |
| Sept. 14 | Forty-sixth street, north side, 1 east of First avenue |
| Oct. 10 | Sixtieth street, south side, 1 east of First avenue |
| Oct. 16 | Edgecombe avenue, west side, 2 north of One Hundred and Fifty-fifth street |
| | Amsterdam avenue, northeast corner of One Hundred and Sixty-seventh street |
| Oct. 24 | Ninety-third street, south side, 3 east of Third avenue |
| Nov. 5 | Eighty-fourth street, north side, 1 east of Broadway |
| Nov. 10 | Clay avenue, east side, 2 north of One Hundred and Sixty-eighth street |
| Nov. 16 | Chambers street, north side, 1 east of Broadway |
| Dec. 29 | Manhattan street, southeast corner of Twelfth avenue |

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G.

ment, through this office, from the persons named therein, for the cost of repairs, as

| Persons Responsible. | Amount Collected. |
|---|---|
| Adams Express Company, No. 61 Broadway, New York City | $21 20 |
| A. F. Karsten, No. 2235 Broadway, New York City | 13 20 |
| B. Conn, No. 151 New Main street, Yonkers, N. Y | 27 40 |
| Thos. Cockrey, No. 303 East Ninety-eighth street, New York City | 17 70 |
| A. J. Juillard & Co., No. 70 Worth street, New York City | 8 00 |
| Howard Laundry, No. 1198 Third avenue, New York City | 8 00 |
| Thos. McLarnon, No. 633 West Fiftieth street, New York City | 35 40 |
| Berck & Pearlman, No. 14 Harlem Market, New York City | 17 70 |
| Geo. Ehret Brewing Company, Ninety-second street and Third avenue, New York | 8 00 |
| Peter Doelger Brewing Company, Fifty-fifth street and First avenue, New York | 17 70 |
| Owens & Co., Forty-seventh street and East River, New York | 17 70 |
| Sicilian Asphalt Paving Company, No. 41 Park row, New York City | 12 50 |
| Jacob Ruppert, Third avenue and Ninetieth street, New York | 17 70 |
| John Wanamaker, Broadway and Ninth street, New York | 17 70 |
| William Brennan, One Hundred and Twenty-ninth street and Broadway, New York | 4 00 |
| Consolidated Telegraph and Electrical Subway Company, No. 66 Lafayette street, New York | 17 70 |
| Young Men's Christian Association, No. 318 West Fifty-seventh street, New York | 17 70 |
| Adams Express Company, No. 61 Broadway, New York City | 8 00 |
| Snare & Triest Company, No. 143 Liberty street, New York | 8 00 |
| Consolidated Gas Company, No. 4 Irving place, New York City | 9 70 |
| Farmers' Feed Company, No. 523 East Seventy-sixth street | 17 70 |
| Borden's Milk Company, No. 108 Hudson street, New York | 21 20 |
| A. J. Schwargler, No. 1340 Brook avenue, New York City | 8 00 |
| O'Rourke Engineering Construction Company, No. 1 West Thirty-fourth street, New York | 3 50 |
| Covert & Cottrell, No. 2001 First avenue, New York | 13 20 |
| Total | $368 60 |

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TABLE

Work Performed to Various Public Gas Lamp-posts in the Borough

| Location of Post. | Work Done. |
|---|---|
| Sixtieth street, south side, 1 east of Second avenue..... | Post removed and reset..... |
| Fifty-ninth street, north side, 1 east of First avenue..... | Post removed and reset..... |
| Sixtieth street, south side, 1 east of First avenue..... | Post removed and reset..... |
| Fourth street, south side, 1 east of Mercer street..... | Post removed and reset..... |
| Thirty-seventh street, north side, 3 east of Eighth avenue.... | Post removed and reset..... |
| Forty-fourth street, north side, 3 east of Eighth avenue..... | Post removed and reset..... |
| Twenty-first street, south side, 2 east of Sixth avenue..... | Post removed and reset..... |
| Weehawken street, east side, 1 north of Christopher street... | Post removed and reset..... |
| North Moore street, north side, 1 east of Greenwich street.. | Post removed and bracket erected.... |
| Tenth avenue, east side, 2 north of Eighteenth street..... | Post removed and bracket erected.... |
| Thirty-second street, south side, 1 east of Eleventh avenue... | Post removed..... |
| Sixty-second street, south side, 1 east of Lexington avenue.. | Post removed..... |
| Thirty-first street, south side, 4 east of Tenth avenue..... | Post removed..... |
| Thirty-first street, north side, 3 east of Tenth avenue..... | Post removed..... |
| Thirty-fourth street, northeast corner of Madison avenue.... | Post removed..... |
| Forty-sixth street, north side, 2 east of Fifth avenue..... | Post removed..... |
| Twentieth street, north side, 4 east of Sixth avenue..... | Post reset..... |
| Seventy-ninth street, south side, 1 east of West End avenue. | Post reset..... |
| Seventy-fifth street, north side, 4 east of Columbus avenue... | Post reset..... |
| Audubon avenue, west side, 1 north of One Hundred and Seventy-seventh street..... | Post reset..... |
| Madison avenue, west side, 1 north of Eightieth street..... | Column refitted..... |
| Fifth avenue, southwest corner of Fifteenth street..... | Column refitted..... |
| Fifth avenue, southwest corner of Seventeenth street..... | Column refitted..... |
| Madison avenue, southwest corner of Forty-seventh street... | Column refitted..... |
| Madison avenue, southwest corner of Sixty-sixth street..... | Column refitted..... |
| Madison avenue, southwest corner of Seventy-fourth street... | Column refitted..... |
| Columbus avenue, southwest corner of Sixty-first street..... | Column refitted..... |
| Ninth avenue, northeast corner of Forty-ninth street..... | Column refitted..... |
| Ninth avenue, southwest corner of Fifty-fifth street..... | Column refitted..... |
| Columbus avenue, southwest corner of Ninety-fourth street.. | Column refitted..... |
| Third avenue, northwest corner of Eighty-fourth street..... | Column refitted..... |
| Madison avenue, southwest corner of Sixty-sixth street..... | Post straightened..... |
| Pearl street, west side, 1 north of John street..... | Post straightened..... |

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H.

of Manhattan, During the Year 1908, at the Expense of Private Persons.

| Name of Person Paying for Work. |
|---|
| Snare & Triest, No. 143 Liberty street. |
| Snare & Triest, No. 143 Liberty street. |
| Snare & Triest, No. 143 Liberty street. |
| Brander Building Construction Company, Nos. 141 and 143 West One Hundred and Twenty-fifth street. |
| Danl. S. Dryer, Nos. 143 to 153 West Twenty-ninth street. |
| John Downey, No. 410 West Thirty-fourth street. |
| Levering & Garrigues, No. 552 West Twenty-third street. |
| Thomas Lynch, No. 21 West street. |
| Seaman Bros., Hudson and North Moore street. |
| Jas. S. Maher, No. 1267 Broadway. |
| O'Rourke Engineering Construction Company, No. 1 West Thirty-fourth street. |
| J. Mundorf, No. 140 East Sixty-second street. |
| New York Contracting Company, No. 215 West Thirty-third street. |
| New York Contracting Company, No. 215 West Thirty-third street. |
| Whitney, Steen & Co., No. 135 Broadway. |
| Thomas Cummins Construction Company, No. 444 East Sixty-ninth street. |
| Chas. Brogan, No. 29 West Twentieth street. |
| John Downey, No. 410 West Thirty-fourth street. |
| Jacob A. Zimmerman, Broadway and Thirty-sixth street. |
| Washington Heights Development and Construction Company. |
| New York Telephone Company, No. 15 Dey street. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Office of the Borough President, Manhattan. |
| Bradley & Smith, No. 251 Pearl street. |

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TABLE

Work Performed to Various Gas Lamp-posts in the Borough of The

| Location of Post. | Work Done. |
|---|---|
| Two Hundred and First street, north side, 1 east of Decatur avenue | Post removed and reset |
| Willow avenue, east side, 1 north of One Hundred and Thirty-sixth street | Post removed and reset |
| Willow avenue, east side, 1 north of One Hundred and Thirty-sixth street | Post reset |

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I.

Bronx, During the Year 1908, at the Expense of Private Persons.

| Name of Person Paying for Work. |
| --- |
| Handy Bros., No. 2330 Morris avenue. |
| International Manufacturing Company, of Willow avenue, between One Hundred and Thirty-sixth and One Hundred and Thirty-seventh streets. |
| John H. Dewes, No. 287 Fourth avenue. |

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## TABLE J.

Summary of Tables H and I, Showing Number of Public Gas Lamp-posts in the Boroughs of Manhattan and The Bronx, Repaired During the Year 1908, at the Expense of Private Persons.

| Work Performed. | Manhattan. | The Bronx. | Total. |
|---|---|---|---|
| Posts removed and reset | 8 | 2 | 10 |
| Posts removed and brackets erected | 2 | .. | 2 |
| Posts removed | 6 | .. | 6 |
| Posts reset | 4 | 1 | 5 |
| Posts straightened | 2 | .. | 2 |
| Columns refitted | 11 | .. | 11 |

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## TABLE K.

New Ornamental Fire Alarm and Signal Lamp-posts in Commission December 31, 1908, in the Borough of Manhattan.

| Location of Post. | Kind of Lamp. |
|---|---|
| Frankfort street, north side, opposite Gold street | Mantle gas lamp |
| Spring street, southwest corner of Broadway | Mantle gas lamp |
| Grand street, southwest corner of Chrystie street | Mantle gas lamp |
| Houston street, northwest corner of Bowery | Mantle gas lamp |
| Great Jones street, southwest corner of Bowery | Mantle gas lamp |
| Twenty-third street, northwest corner of Ninth avenue | Mantle gas lamp |
| Twenty-third street, northwest corner of Sixth avenue | Mantle gas lamp |
| Twenty-fifth street, southwest corner of Eighth avenue | Mantle gas lamp |
| Thirty-third street, northeast corner of Lexington avenue | Mantle gas lamp |
| Thirty-seventh street, southeast corner of Sixth avenue | Mantle gas lamp |
| Forty-second street, southwest corner of Third avenue | Mantle gas lamp |
| Fiftieth street, southwest corner of Madison avenue | Mantle gas lamp |
| Fifty-eighth street, northeast corner of Lexington avenue | Mantle gas lamp |
| Fifty-eighth street, southwest corner of Second avenue | Mantle gas lamp |
| Sixty-sixth street, northwest corner of Central Park West | Mantle gas lamp |
| Sixty-fifth street, northwest corner of Park avenue | Mantle gas lamp |
| Seventy-eighth street, southwest corner of West End avenue | Mantle gas lamp |
| Eighty-second street, southwest corner of West End avenue | Mantle gas lamp |
| One Hundred and Thirtieth street, northwest corner of Park avenue | Mantle gas lamp |
| Spruce street, northeast corner of William street | Mantle gas lamp |

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TABLE

Permits Granted for Erection of Private Lamps on Public

| To Whom Granted. | Date of Permit. | Lamps to Be Erected. |
|---|---|---|
| Joseph A. Haefelin, No. 3924 Broadway, City | Mar. 31, 1908 | One (1) ornamental gas lamp, with mantle burner, same as in public street lamps |
| Hotel Marie Antoinette, Broadway, Sixty-seventh and Sixty-sixth streets | Dec. 23, 1908 | Two (2) 100-watt tungsten electric incandescent lamps |
| R. H. Macy & Co., Broadway, Thirty-fourth and Thirty-fifth streets | Dec. 23, 1908 | One (1) electric arc lamp |
| Angelo Langarzo, No. 694 Ninth avenue | Dec. 29, 1908 | One (1) 48-watt electric incandescent lamp |

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L.

Highways in the Borough of Manhattan, During the Year 1908.

Proposed Locations of Lamps.

Broadway, east side, between One Hundred and Sixty-fourth and One Hundred and Sixty-fifth streets, on existing public dead post.

On Porche Cochere at curb Sixty-sixth street, north side, west of Broadway.

Thirty-fifth street, south side, west of Broadway, suspended from bracket on wall of building.

Ninth avenue, east side, between Forty-seventh and Forty-eighth streets, on private post.

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## REPORT OF THE DIVISION OF STREET LIGHTING, BUREAU OF LAMPS AND LIGHTING, BOROUGH OF BROOKLYN

December 31, 1908.

Mr. CHARLES F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I submit herewith a report of the work accomplished by this Bureau during the year 1908.

There were 96 new electric arc lamps erected and lighted, 84 450-watt and 2 325-watt lamps by the Edison Electric Illuminating Company, and 10 400-watt lamps by the Flatbush Gas Company.

There were 50 lamps discontinued by the Edison Electric Illuminating Company and three discontinued and relighted by the Flatbush Gas Company. Of the former, but 18 were discontinued permanently, 3 of which were in line of bridge approaches; 13 were replaced by mantle gas lamps, and 2 325-watt lamps on the stoop line of the Hall of Records, were discontinued; in lieu of the latter, however, 2 other 325-watt lamps were installed, 1 of which was swung from an outrigger over the entrance to this same building, and another of similar construction, in front of Kings County Court House; the total number of arc lamps December 31, 1908, being 5,423.

A total of 480 new mantle lamps were installed in the Borough (excepting the Thirtieth Ward) by the New York and New Jersey Globe Gas Light Company, 376 of which were in the Brooklyn Union Gas Company's district, and 104 in the Thirty-first Ward, or the Brooklyn Borough Gas Company's district.

The 225 mantle gas lamps relighted by this company includes 30 permanently relighted lamps on existing capped lamp-posts; 168 lamps that were discontinued temporarily on account of no gas, or pending repairs to lamp-posts, and 27 lamp-posts that were removed and reset to more desirable locations during the year.

Of the 245 mantle lamps discontinued, 45 were permanent on account of electric lighting replacing, or as being unnecessary; 27 were removed to other locations, and 173 were temporary on account of no gas or other causes; the total number of lamps operated by this company on December 31, 1908 being 13,641.

There were 2,391 lamps discontinued and relighted by the Kings County Lighting Company. These were discontinued as open flame gas lamps, and relighted as mantle gas lamps early in the year; the balance, 2,159 lamps, having been so changed during December, 1907; the entire change-over being made in about four weeks' time. This company closed the year with 4,558 mantle gas lamps.

In the section known as Homewood, 8 lamps which were erected and have been maintained for a number of years by the Harbor and Suburban Homes Company on legally open and much traveled streets, were taken over by the City on January 1, 1908, the company transferring their ownership of posts and equipment to the City.

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There were but 2 open flame gas lamps in this Borough at the close of the year 1908, and these are not at curb, but are special lamps on the stoop of the building of the Society for the Prevention of Cruelty to Children, on the north side of Schermerhorn street, just east of Boerum place. The society owns these lamps, lights and extinguishes same, the City paying for gas supply only.

There were no additions or deductions made to the 656 naphtha mantle lamps in the parks and on the parkways of this Borough during the year, and no change made in the open flame naphtha lamps, 12 in number, lighting the main street on Barren Island.

The changes in location of lamps in the district of the Kings County Lighting Company are given in Table "A," where 8 new lamps were added, and with the list of complete lamp-posts removed and reset at other locations it was thought advisable to include the lamps reset during 1907, as these were part of a general order issued to the Kings County Lighting Company in 1907 to remove and reset 365 lamps and posts. This work was begun in December, 1907, and completed during 1908. The number of lamps and cost of rearrangement appears in 1907 report, and the locations are given here to show the entire improvement in the lighting of the streets in this section, which was made possible by a supplementary contract, which was secured through the agency of the Chief Engineer of Light and Power, and endorsed by the Commissioner of this Department, in 1907, made between the City and the Kings County Lighting Company. This company was then operating under a long-term contract, expiring December 31, 1914. By the terms of this contract the City was not allowed to change the location of any post when once erected, and was obliged to pay $28 per lamp per year for all lamps burning, or thereafter added in this Ward.

By the concessions secured the company agreed to change all lamps to mantle lamps without extra expense to the City, and also granted the right to change the location of any posts desired, at a fair price for the removing and resetting of same. As many of these lamps were practically in the fields or on unimproved streets, they were removed and reset on streets that were built upon and improved.

The 178 lamps so reset in December, 1907, and the 228 lamps that were reset during 1908, can be practically classed as new lighting, while the 47 lamps are lamps that were rearranged to better advantage on streets already lighted, from which some lamps had been removed to other locations, or on streets that were being regraded, and a rearrangement of posts could be made to better advantage, from a lighting standpoint, as the resetting of posts to grade became necessary.

The original estimate that 365 lamp-posts required to be removed and reset at new locations, which was made the basis of an order to this company, it was discovered would not fully meet the situation, because during the year 2,198 new buildings were erected, many on unlighted streets, and as this situation could be taken care of by removing and resetting other lamp-posts, orders were therefore issued for 88 posts additional to be set at new locations, making a total of 453 posts removed and reset

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under this agreement, which orders were accepted and executed by the company without protest. Deducting 47 posts that were rearranged, will leave 406 posts at new locations.

The average cost for this work was $10.79 per post; the price per lamp per year for the maintenance of this company's lamps is $28 during the continuance of the present contract.

Had this lighting been treated as new work, these 406 lamps—allowing $9 per post for cost of erection, etc.—would have cost $15,022 for the year, deducting the expense of removing and resetting—$4,380.74—an actual saving of $10,641.26 has been effected on the first cost, as well as accomplishing entirely satisfactory results in the matter of street lighting.

Great care was exercised to shift lamp-posts only from such locations where their use was least serviceable, from unimproved localities, and but three complaints have been received, with request for the reestablishment of posts at given locations, which have received the attention of the Bureau, and been adjusted satisfactorily. It is remarkable that these great changes could have been effected with so little friction and protest.

Table "B" shows the different sizes and the number of feet of mains relaid and cost of same; also the number of posts reset to grade, and cost of same; the posts removed and reset to new locations, and cost of same, in the Thirtieth Ward. This is the district of the Kings County Lighting Company, which is operating under an old long-term contract, which provides that the City shall pay for relaying of mains and resetting of lamp-posts when the grade of the street is changed. All minor repairs are made by the contractor without charge.

The 2,369 feet of new main shown to have been laid, was on Eighty-sixth street, between Thirteenth and Sixteenth avenues, where there was an extraordinarily deep fill required to bring the street to proper grade, the street being for a portion of the distance 12 to 14 feet below proper grade, and it was found to be cheaper to abandon the old main and relay an entirely new one. This work was under way for about a year, and the Kings County Lighting Company kept the 25 lamps along the line of this improvement constantly in commission by first resetting them to building line and raising them on mounds as the work of filling in was being made, finally resetting them in permanent locations to proper line of curb. Although reset many times, the resetting was only charged for twice. The company submitted a bill of particulars showing cost of labor and material to be $5,087.25 for the entire work, for laying 12-inch main, and taking care of old main and of lamp-posts during the progress of the work; but as their original estimate was at the rate of $1.50 per foot for the laying of main, after a conference with you, they were induced to accept this rate, thereby saving several hundreds of dollars to the City.

In the district supplied by the Edison Electric Illuminating Company there were 17 additional lights installed on Broadway, from Roebling street, at entrance

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to Williamsburg Bridge to Lafayette avenue, and the rearrangement of the existing arc lamps between these points. As a similar improvement was made to the upper part of Broadway, from Lafayette avenue east to East New York, during 1907, this important thoroughfare is now well lighted for its entire length.

The lighting of the new Grand street extension, from Grand street to the Williamsburg Bridge plaza, and the additional lights provided to Roebling street, which had been widened from Grand street to bridge plaza, were also much needed improvements. Most of the other lamps installed by this company were in the suburban sections.

Table "C" shows the mileage of streets lighted by the various kinds of lamps. About 755 miles of streets and parkways are lighted. As the total mileage of paved streets in this borough amounts to 671 miles, it can be seen that over 90 miles of unpaved streets are lighted.

Table "D" shows the location, number and kind of lamps discontinued during the year 1908 by the various lighting companies, and the reasons therefor. In addition to number of lamps listed, 37 arc lamps operated by the Edison Electric Illuminating Company were out of service a total of 212 nights on account of damage to poles. These were deducted from monthly bills of this company as "Lamps Temporarily Out of Service." Several other lamp-poles were damaged or broken down, but lamps were placed in service again the same day on a temporary pole. These lamps are reported both by the Company and our Inspectors, and a book account is kept of them, so that no lamp may be lost track of; but they are not listed as discontinued lamps, for the reason that they were out for so short a time.

Table "E" shows the number and kind of lamps reported as outages by the Police and by Department Inspectors during the year. A total of 15,362 lamps were reported, of which 795 were duplicated—that is, they were reported by both the Police and our Inspectors. Deducting these duplicates, shows total to be 14,567; to this is added 37 lamps temporarily out of service, reported by the Edison Electric Illuminating Company and verified by our Inspectors as being out a total of 212 nights. This brings the total net outages to 14,779 lamps, of which 10,143 were electric lamps, 4,012 were mantle gas and 624 were mantle naphtha lamps.

Table "F" shows the time of lighting and extinguishing the public lamps in the Twenty-ninth and Thirtieth Wards. These Wards are the only ones in the Borough that do not light and extinguish as per official time table printed in the Manhattan report.

The time for lighting the 750 arc lamps in the Twenty-ninth Ward is one-half hour after sunset, and the time for extinguishing same one-half hour before sunrise. These lamps are operated by the Flatbush Gas Company, whose contract expires May 1, 1909, when the official time table will go into effect.

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All other lamps in this borough are lighted and extinguished as per official time table published in Manhattan Borough report; there being 4,673 electric arc, 13,641 mantle gas, 2 open flame gas, 656 mantle naphtha, and 12 open flame naphtha lamps lighted and extinguished as per that schedule.

Table "G" is a statement of minor repairs needed to lamps, and is compiled from the daily reports of Inspectors, and shows that 4,137 repairs were necessary, for which notices were sent to the various lighting companies operating the lamps. Although these repairs are made by the companies, without charge to the City, and seem of little value, it is most important that they be attended to promptly, which has been the case throughout the year, so that lamps may render good service.

Table "H" shows the work done to lamp-posts at the expense of private parties, comprising removals and resets of lamp-posts in commission. All capped posts requested to be removed are taken out without cost, for the reason that these posts are required for stock, as all posts erected at new locations were old posts removed from the streets lighted by electric lamps.

Sale of Old Material—After the completion of the work of changing all the open flame lamps to mantle lamps in the Thirtieth Ward, an auction sale was held on June 12, and all the lamp stock was offered for sale, as there was no more use for same, there being no open flame lamps in the Borough. This stock consisted of square lanterns, square frames, boulevard globes and frames, porcelain domes, metal reflectors and canopies, miner lamps, and four tons of broken lamp-posts, which had been a long time acumulating. No bids were received for some of this stock, and the party purchasing square lanterns refused to take them, as they could not be utilized for any purpose. In consequence there is still stored in the water supply pipe yards, the following:

| | |
|---|---|
| Square lanterns | 2,800 |
| Square frames | 150 |
| Boulevard frames | 200 |
| Reflectors | 100 |
| Boulevard globes | 40 |
| Boulevard domes | 100 |
| Police globes | 17 |

All gas lamp-posts used for new lighting at the present time, are the unused capped posts removed from the streets by the Brooklyn Union Gas Company at a cost of $3.50 per post; 847 being removed during the year; of these, 365 were used for new lighting by this company, 20 for resetting in place of ones broken, 80 were transferred to the Brooklyn Borough Gas Company, to be erected on the streets in the Thirty-first Ward, and over 300 were sent to the Borough of Queens to be erected on streets lighted by the Jamaica Gas Light Company, and the Newtown Gas Company. The number on hand December 31, being 113 posts and 7 extra columns stored

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in the various yards of the gas companies throughout the Borough. By this method of storing posts, the expense of carting, and maintaining a storehouse, is eliminated. Many of these posts removed are broken in the ground, having been in place for several years; these are sold as old iron when an auction sale is held by the City.

Inspection and Office Service—The force of Inspectors comprised 10 men January 1, 1908, 9 of whom had regular inspection districts, and one being assigned to the office, to assist in the work of handling Inspectors' reports and other office work, for which he seems to be especially fitted; this Inspector also makes special and night inspections. An additional Inspector was appointed on April 11, which allowed the dividing up of two of the largest inspection districts, thus making 10 districts; said districts are divided into sections, one of which is covered daily by the Inspector for four hours, except on the last two days of the month, when the entire force is required to read the indexes of gas and electric meters in the various public buildings. The night work of Inspectors is not confined to any particular section of their districts, as they try to cover as much of the entire district as possible.

The Inspectors pass on all new lamps erected, and orders for repairs to lamp-posts, involving cost, are not issued until Inspectors have first made an examination of post, and reported repairs necessary. The gas companies send weekly reports of all work done to lamp-posts, and these reports are checked by the Inspectors, and afterward, monthly bills are checked with such reports, as well as being checked with order book and Bureau map. A total of 456 repair orders were issued during the year.

Three hundred and thirty-four lighting orders were issued during the year, covering new lighting or the rearrangement of lighted lamps, and it was the duty of Inspectors to pass on all the work involved in these orders also.

A check of locations and number of all Edison electric arc lamps in the Borough, was completed early in the year, as there was a difference in the number billed and the number of locations submitted by the company; this was finally straightened out after inspecting every doubtful location.

After this check was made, corrected lists were prepared in the Manhattan Office, and copies furnished this office and the Edison Company, and all additions and deductions are made to that list as they occur.

A similar check and list was afterwards made of the arc lamps operated by the Flatbush Gas Company, in the Twenty-ninth Ward and on Ocean parkway; this list is also kept corrected as changes in the location or number of lamps occur.

All gas lamps and posts were painted, and the Inspectors, when checking this work, also made a list of locations of all the lamp-posts, so that the number painted, and the Bureau map showing locations of all lamps, could at the same time be verified.

The changing of all the open flame lamps in the Thirtieth Ward, to mantle lamps, and the rearrangement of lamp-posts in this ward, also entailed much labor on the

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part of two Inspectors detailed there, and both of these men are to be commended for their good work, as they had to work many hours over time during the progress of this change-over. One Inspector checked list and locations of all lamps changed to mantle lamps, while the other inspected all removals of posts, and saw that same were properly reset at the new locations ordered.

In submitting this report for the year 1908, I desire to commend the attaches of the office, for such attention to their various duties, as Clerks, Stenographers and Inspectors, who have assisted to make the business of the year a success. In most instances their services have been cheerfully rendered, and the matters submitted for their attention have received intelligent and prompt handling. The Junior Clerk, in addition to his clerical duties, has acted also as draftsman, in making plans and diagrams, and also plotting the Bureau map, for which reason, I desire to give him this special mention. The office force is quite adequate for its purposes.

There is much territory in the Borough, into which the various systems of lighting will have to be extended in the near future; land companies and individual builders are vastly improving the outlying sections, and these improvements will render insistent, requests for lighting.

The work during the year, because of many changes and some new features which have been adopted, has been somewhat arduous; but its successful accomplishment is a source of great pleasure.

We have on file in this Bureau a number of letters received from citizens, in approval of the improved lighting conditions.

Very respectfully,

J. F. BUSSING, General Inspector of Street Lighting, Borough of Brooklyn.

Approved:

Wm. G. Quirk, General Inspector of Street Lighting.

TABLE "A."

Showing the Location of Mantle Gas Lamps Relocated in the District of the Kings County Lighting Company During 1907 and 1908.

| Locations. | 1907. | 1908. |
|---|---|---|
| East Second street, between Avenues I and J..... | .. | 5 |
| East Second street, northeast corner of Avenue J..... | .. | 1 |
| East Fourth street, west side, between Elmwood avenue and Avenue I | .. | 1 |
| East Fourth street, west side, 140 feet south of Avenue I..... | .. | 1 |
| East Fifth street, east side, between Elmwood avenue and Avenue I | .. | 1 |
| East Fifth street, east side, 140 feet south of Avenue I..... | .. | 1 |

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| Locations. | 1907. | 1908. |
|---|---|---|
| New Utrecht avenue, southeast corner of Ninth avenue | .. | 1 |
| Ninth avenue, east side, north of New Utrecht avenue | .. | 1 |
| Thirty-ninth street, south side, 130 feet west of Ninth avenue | .. | 1 |
| Thirty-ninth street, between Ninth and Tenth avenues | 7 | .. |
| Fortieth street, between Ninth avenue and New Utrecht avenue | 3 | .. |
| Tenth avenue, northwest corner of New Utrecht avenue | 1 | .. |
| Twelfth avenue, west side, first north of Forty-first street (church) | .. | 1 |
| Forty-first street, south side, first west of New Utrecht avenue | 1 | .. |
| Forty-first street, north side, first west of New Utrecht avenue | 1 | .. |
| Forty-first street, between Twelfth and Thirteenth avenues | .. | 4 |
| Forty-first street, northwest and southeast corners of Thirteenth avenue | 2 | .. |
| Forty-first street, south side, 290 feet east of Thirteenth avenue | 1 | .. |
| Forty-second street, northeast corner of New Utrecht avenue | 1 | .. |
| Forty-second street, north side, first west of Thirteenth avenue | 1 | .. |
| Forty-second street, south side, first east of Thirteenth avenue | 1 | .. |
| Forty-second street, north side, first east of Thirteenth avenue | 1 | .. |
| Forty-second street, southwest and northeast corners of Thirteenth avenue | 2 | .. |
| Forty-third street, northwest and southeast corners of Thirteenth avenue | 2 | .. |
| Forty-third street, northeast corner of Fort Hamilton avenue | 1 | .. |
| Forty-third street, north side, first and second east of Thirteenth avenue | 2 | .. |
| Forty-third street, south side, first east of Thirteenth avenue | 1 | .. |
| Forty-fourth street, north side, first west of New Utrecht avenue | 1 | .. |
| Forty-fourth street, between Thirteenth and Fourteenth avenue | 5 | .. |
| Twelfth avenue, west side, 50 feet north of Forty-fifth street (church) | 1 | .. |
| Fifteenth avenue, west side, first north of Forty-fifth street | .. | 1 |
| Sixteenth avenue, east side, first north of Forty-fifth street | .. | 1 |
| Forty-fifth street, southeast corner of New Utrecht avenue | 1 | .. |
| Forty-fifth street, between Fourteenth and Fifteenth avenues | 5 | .. |
| Forty-fifth street, south side, first, second and third east of Seventeenth avenue | .. | 3 |
| Forty-sixth street, northwest corner of Eleventh avenue | .. | 1 |
| Forty-sixth street, between New Utrecht avenue and Twelfth avenue | 4 | .. |
| Forty-sixth street, between Seventeenth and Eighteenth avenues | .. | 3 |
| Eleventh avenue, east side, first north of Forty-seventh street | 1 | .. |

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| Locations. | 1907. | 1908. |
|---|---|---|
| Eleventh avenue, west side, first north of Forty-eighth street..... | 1 | .. |
| Forty-seventh street, between Fort Hamilton and Eleventh avenues. | 7 | .. |
| Forty-eighth street, between Fort Hamilton and New Utrecht avenues | 5 | .. |
| Forty-eighth street, northeast corner of Sixteenth avenue..... | .. | 1 |
| Forty-eighth street, south side, first east of Sixteenth avenue..... | .. | 1 |
| Thirteenth avenue, east side, first north of Forty-eighth street (church) ..... | .. | 1 |
| Fifteenth avenue, east side, first north of Forty-eighth street (church) | .. | 1 |
| Forty-ninth street, northeast corner of New Utrecht avenue..... | .. | 1 |
| Fiftieth street, between Eleventh and Thirteenth avenue..... | 10 | .. |
| Fiftieth street, south side, 50 feet east of Fourteenth avenue (church) | .. | 1 |
| Fiftieth street, south side, second east of Sixteenth avenue..... | .. | 1 |
| Fifieth street, north side, second east of Sixteenth avenue..... | .. | 1 |
| Fourteenth avenue, west side, second north of Fiftieth street (church) | .. | 1 |
| Fifty-first street, south side, first west of Twelfth avenue..... | 1 | .. |
| Fifty-first street, north side, first west of Twelfth avenue..... | 1 | .. |
| Fifty-first street, northwest and southwest corners of Twelfth avenue. | 2 | .. |
| Fifty-first street, northeast corner of New Utrecht avenue..... | .. | 1 |
| Fifty-first street, between New Utrecht and Thirteenth avenues..... | .. | 2 |
| Fifty-first street, southeast corner of Sixteenth avenue..... | .. | 1 |
| Fifty-second street, between Eighth and Tenth avenues..... | 11 | .. |
| New Utrecht avenue, east side, first north of Fifty-second street..... | .. | 1 |
| New Utrecht avenue, southeast corner of Fifty-second street..... | .. | 1 |
| New Utrecht avenue, northeast corner of Fifty-third street..... | .. | . |
| Fifty-third street, north side, between Eighth and Ninth avenues..... | .. | 2 |
| Fifty-third street, between Twelfth and New Utrecht avenues..... | .. | 3 |
| Fifty-third street, between Fifteenth and Sixteenth avenues..... | .. | 4 |
| Fifty-third street, between Twentieth and Twenty-first avenues..... | .. | 4 |
| Fifty-fourth street, between Fifteenth and Sixteenth avenues..... | .. | 4 |
| Fifty-fourth street, northwest and southeast corners of Sixteenth avenue ..... | .. | 2 |
| Fifty-sixth street, between Fort Hamilton and Eleventh avenues..... | 4 | .. |
| Fifty-sixth street, southwest and northeast corners of Eleventh avenue ..... | 2 | .. |
| Fifty-sixth street, between Eleventh and Twelfth avenues..... | .. | 4 |
| Fifty-seventh street, between Fort Hamilton and Eleventh avenues.. | 4 | .. |
| Fifty-ninth street, between Seventh and Ninth avenues..... | .. | 11 |
| Sixtieth street, south side, between Third and Fourth avenues..... | 2 | .. |

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| Locations. | 1907. | 1908. |
|---|---|---|
| Sixty-first street, between Third and Fourth avenues | 4 | .. |
| Sixty-first street, northwest and southeast corners of Sixteenth avenue | .. | 2 |
| Sixty-first street, between Sixteenth and Seventeenth avenues, including corners | .. | 7 |
| Sixty-first street, south side, first east of Seventeenth avenue | .. | 1 |
| Sixty-first street, north side, first east of Seventeenth avenue | .. | 1 |
| Seventeenth avenue, east side, first north of Sixty-second street (church home) | .. | 1 |
| Sixty-second street, between Fourth and Fifth avenues | 5 | .. |
| Sixty-second street, northwest and southeast corners of Seventeenth avenue | .. | 2 |
| Sixty-second street, between Twentieth and Twenty-first avenue | .. | 3 |
| Sixty-third street, southeast corner of Twelfth avenue | .. | 1 |
| Sixty-third street, between Nineteenth and Twentieth avenues | .. | 4 |
| Fourteenth avenue, east side, first north of Sixty-fourth street (church) | .. | 1 |
| Twelfth avenue, east side, first north of Sixty-fourth street (church) | .. | 1 |
| Sixty-fourth street, between Twelfth and Thirteenth avenues | .. | 5 |
| Sixty-fifth street, north side, between Third and Fourth avenues | .. | 4 |
| Sixty-fifth street, south side, first west of Eighteenth avenue | .. | 1 |
| Sixty-fifth street, north side, first west of Eighteenth avenue | .. | 1 |
| Sixty-fifth street, between Eighteenth and Nineteenth avenues | .. | 4 |
| Wakeman place, south side, first and second east of Second avenue | 2 | .. |
| Wakeman place, south side, third east of Second avenue | .. | 1 |
| Sixty-seventh street, south side, first and second east of Fifth avenue | 2 | .. |
| Sixty-seventh street, between Eighteenth and Nineteenth avenues | .. | 3 |
| Senator street, between Third and Fifth avenues | 8 | .. |
| Fifteenth avenue, east side, first north of Ovington avenue (church) | .. | 1 |
| Sixty-eighth street, between New Utrecht and Sixteenth avenues | .. | 4 |
| Fourteenth avenue, west side, first north of Sixty-ninth street (church) | .. | 1 |
| Sixty-ninth street, south side, first west of Eighteenth avenue | .. | 1 |
| Sixty-ninth street, between Eighteenth and Nineteenth avenues | .. | 3 |
| Sixteenth avenue, east side, first north of Seventieth street | .. | 1 |
| Silliman place, between Second and Third avenues | 4 | .. |
| Seventy-first street, between Second and Third avenues | 4 | .. |
| Sixteenth avenue, northwest and southeast corners of Seventieth street | .. | 2 |
| Seventy-second street, southeast corner Sixth avenue | 1 | .. |
| Seventy-second street, north side, first east of Sixth avenue | 1 | .. |

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| Locations. | 1907. | 1908. |
|---|---|---|
| Seventy-second street, north side, first and second west of Fort Hamilton avenue | .. | 2 |
| Seventy-second street, south side, first west of Fort Hamilton avenue. | .. | 1 |
| Seventy-second street, southeast corner of Eighth avenue | .. | 1 |
| Seventy-second street, north side, first east of Eighth avenue | .. | 1 |
| Seventy-second street, south side, first east of Eighth avenue | .. | 1 |
| Seventy-second street, between Sixteenth and Seventeenth avenues | .. | 5 |
| Seventy-second street, south side, first east of Seventeenth avenue | .. | 1 |
| Seventy-second street, north side, first east of Seventeenth avenue | .. | 1 |
| Seventh avenue, northwest corner of Seventy-second street | 1 | .. |
| Seventh avenue, west side, first north of Seventy-third street | 1 | .. |
| Seventy-third street, between Fourth and Fifth avenues | 4 | .. |
| Seventy-third street, northeast corner of Sixth avenue | 1 | .. |
| Seventy-third street, north side, first west of Seventeenth avenue | .. | 1 |
| Seventy-third street, south side, first west of Seventeenth avenue | .. | 1 |
| Seventy-third street, south side, first and second east of Sixth avenue | .. | 2 |
| Seventy-third street, north side, first east of Sixth avenue | .. | 1 |
| Seventy-third street, between Sevententh and Eighteenth avenues | .. | 4 |
| Fifteenth avenue, east side, first north of Seventy-third street (Church) | .. | 1 |
| Sixteenth avenue, southeast corner of New Utrecht avenue | .. | 1 |
| Seventy-fourth street, between Fifth and Sixth avenues | 4 | .. |
| Seventy-fourth street, northwest corner of Sixth avenue | 1 | .. |
| Seventy-fourth street, between Eleventh and Thirteenth avenues | .. | 11 |
| Seventy-fourth street, between New Utrecht and Seventeenth avenues. | .. | 6 |
| Seventy-fourth street, between Seventeenth and Eighteenth avenues | .. | 4 |
| Fifteenth avenue, west side, first north of Seventy-sixth street | .. | 1 |
| Seventy-sixth street, between Second and Third avenues | 4 | .. |
| Seventy-sixth street, between Fifth and Sixth avenues | 3 | .. |
| Seventy-sixth street, north side, first west of Fifteenth avenue | .. | 1 |
| Seventy-sixth street, between Fifteenth and Sixteenth avenues | .. | 5 |
| Seventy-seventh street, north side, first east of Seventeenth avenue | .. | 1 |
| Seventeenth avenue, northeast corner of Seventy-seventh street | .. | 1 |
| Seventeenth avenue, east side, first north of Seventy-eighth street | .. | 1 |
| Seventeenth avenue, southeast corner of Seventy-eighth street | .. | 1 |
| Seventeenth avenue, northwest corner of New Utrecht avenue | .. | 1 |
| Seventy-eighth street, north side, first east of Seventeenth avenue | .. | 1 |
| Seventy-eighth street, between Fifth and Sixth avenues | 4 | .. |

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| Locations. | 1907. | 1908. |
|---|---|---|
| Seventy-ninth street, between Twenty-second and Twenty-third avenues | .. | 5 |
| Eightieth street, between First and Second avenues | .. | 4 |
| Seventeenth avenue, west side, between Eightieth and Eighty-second streets | .. | 4 |
| Eighty-fourth street, between Fifth and Fort Hamilton avenues | .. | 4 |
| Eighty-fourth street, north side, first east of Twentieth avenue | .. | 1 |
| Eighty-fifth street, between Second and Third avenues | 4 | .. |
| Eighty-fifth street, between Third and Fourth avenues | 4 | .. |
| Eighty-fifth street, south side, first east of Thirteenth avenues | .. | 1 |
| Eighty-seventh street, between Third and Fourth avenues | 3 | .. |
| Eighty-eighth street, between First and Second avenues | 4 | .. |
| Eighty-eighth street, between Second and Third avenues | 4 | .. |
| Eighty-eighth street, between Fourth and Fort Hamilton avenues | 7 | .. |
| Ninetieth street, between Third and Fifth avenues | .. | 6 |
| Ninety-first street, between Third and Fourth avenues | .. | 4 |
| Gelston avenue, west side, first north of Ninety-second street | 1 | .. |
| Gelston avenue, east side, first north of Ninety-second street | 1 | .. |
| Bay Eleventh street, west side, first north of Benson avenue | .. | 1 |
| Bay Eleventh street, east side, first north of Benson avenue | .. | 1 |
| Bay Twenty-third street, between Benson and Bath avenues | .. | 3 |
| Bay Twenty-third street, between Cropsey and Bath avenues | .. | 3 |
| Total | 178 | 228 |

Lamps Rearranged.

| | |
|---|---|
| Forty-ninth street, southwest and northeast corners of Fifteenth avenue, from street to avenue side | 2 |
| Fifty-second street, between Nineteenth and Twentieth avenues, respaced | 4 |
| Twentieth avenue, between Fifty-second and Fifty-third streets, respaced | 2 |
| Fifty-third street, northeast corner of Fifteenth avenue, from street to avenue side | 1 |
| Fifty-third street, southwest corner of Fifteenth avenue, from street to avenue side | 1 |
| Fifty-fifth street, southeast corner of Fourteenth avenue, from street to avenue side | 1 |
| Fifty-third street, northwest corner of Fourteenth avenue, from street to avenue side | 1 |

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| | |
|---|---|
| Fifty-sixth street, northeast corner of Twelfth avenue, from street to avenue side | 1 |
| Fifty-seventh street, southeast corner of Twelfth avenue, from street to avenue side | 1 |
| Fifty-seventh street, northwest corner of Twelfth avenue, from street to avenue side | 1 |
| Fifty-seventh street, southwest corner of Thirteenth avenue, from street to avenue side | 1 |
| Fifty-seventh street, northeast corner of Thirteenth avenue, from street to avenue side | 1 |
| Bay Ridge avenue, between Eighth and Ninth avenues, respaced | 2 |
| Sixty-third street, between Eighteenth and Nineteenth avenues, respaced | 4 |
| Sixty-fifth street, southeast corner of Eleventh avenue, from street to avenue side. | 1 |
| Sixty-fifth street, northwest corner of Eleventh avenue, from street to avenue side. | 1 |
| Sixty-eighth street, between First and Second avenues, respaced | 4 |
| Seventieth street, northwest corner of Fifteenth avenue, from street to avenue side. | 1 |
| Seventy-first street, between Thirteenth and Fifteenth avenues, respaced | 7 |
| Seventy-ninth street, between Narrows and First avenues, respaced | 4 |
| Eighty-first street, between First and Second avenues, respaced | 4 |
| Twenty-third avenue, northeast corner of Eightieth street, from street to avenue side | 1 |
| Third avenue, east side, north of Ninety-third street, to northeast corner | 1 |
| Total | 47 |

TABLE "B."

Showing Size, Length and Cost of Mains Relaid, Cost of Lamp-posts Reset to Grade, Lamp-posts Removed and Reset in the Thirtieth Ward, by the Kings County Lighting Company During 1908.

| | | |
|---|---|---|
| 2,369 | feet of 12-inch main, replacing old main, at $1.50 per foot | $3,553 50 |
| 120 | feet of 12-inch main, relaid, at 80 cents per foot | 96 00 |
| 120 | feet of 8-inch main, relaid, at 60 cents per foot | 72 00 |
| 250 | feet of 6-inch main, relaid, at 40 cents per foot | 100 00 |
| 3,879 | feet of 4-inch main, relaid, at 30 cents per foot | 1,163 70 |
| 1,614 | feet of services, relaid at 10 cents per foot | 161 40 |
| 8,352 | Total | $5,146 60 |
| 101 | lamp-posts reset to new grade, at $7.50 | 757 50 |
| 227 | lamp-posts removed, dirt foundations, at $2.70 | 624 25 |
| 32 | lamp-posts removed, macadam pavement, at $4 | 131 20 |

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| | | |
|---|---|---|
| 13 | lamp-posts removed, asphalt pavement, at $5.75 | 74 75 |
| 3 | lamp-posts removed, belgian block, at $4.10 | 12 30 |
| 218 | lamp-posts reset, dirt foundations, at $6.25 | 1,362 50 |
| 40 | lamp-posts reset, macadam pavement, at $8.90 | 356 00 |
| 12 | lamp-posts reset, asphalt pavement, at $16.25 | 195 00 |
| 5 | lamp-posts reset, belgian block, at $8.90 | 44 50 |
| 651 | Total | $8,704 60 |

| | |
|---|---|
| Cost of relaying mains | $5,146 60 |
| Cost of resetting 101 posts to grade | 757 50 |
| Cost of removing 275 posts from old locations | 842 50 |
| Cost of resetting 275 posts at new locations | 1,958 00 |
| | $8,704 60 |
| Average cost of removing and resetting the 275 posts | $10.8364 |
| Average cost of removing and resetting of 178 posts, 1907 | $11.1556 |
| Makes total average cost of this work, 1907-1908 | 10.7865 |

## TABLE C.

Showing Mileage of Streets Lighted by Electric, Gas and Naphtha Lamps in Brooklyn During the Year 1908, and Total Miles of Paved Streets.

| | Electric Arc. | | Gas. | | Naphtha. | | Total | | Paved Streets, |
|---|---|---|---|---|---|---|---|---|---|
| | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. | Feet. | Miles. |
| January 1, 1908 | 318 | 3,210 | 403 | 4,915 | 16 | 2,500 | 739 | 65 | .... |
| Added during 1908 | 5 | 800 | 19 | 1,780 | .. | .... | 24 | 2,580 | .... |
| Discontinued during 1908 | .. | 4,800 | 7 | 3,180 | .. | .... | 8 | 2,700 | .... |
| December 31, 1908 | 322 | 4,490 | 415 | 3,515 | 16 | 2,500 | 754 | 5,225 | 671 |

## TABLE D.

## SHOWING LOCATIONS AND NUMBER OF LAMPS DISCONTINUED DURING 1908.

Edison Electric Illuminating Company, Electric 325-watt Arc Lamps.

| Location. | No. |
|---|---|
| In front of Hall of Records, relocated | 2 |
| Total | 2 |

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Edison Electric Illuminating Company, Electric 450-watt Arc Lamps.

| Location, | No. |
|---|---|
| Carroll street, north side, between Rogers and Nostrand avenues (account of gas) | 1 |
| Franklin place, between Front and York streets (account new bridge approach) | 1 |
| Harmon street, south side, between Wyckoff and St. Nicholas avenues (account of gas) | 1 |
| Hemlock street, between Etna street and Jamaica avenue | 1 |
| Montrose avenue, east side, between Graham and Manhattan avenues (account of gas) | 1 |
| Nelson street, south side, between Court and Smith streets (account of gas) | 1 |
| Nichols avenue, northwest corner of Fulton street (account of gas) | 1 |
| Nichols avenue, southeast corner of Etna street (account of gas) | 1 |
| Nichols avenue, east side, between Etna and Jamaica avenues (account of gas) | 1 |
| Pearl street, west side, between Front and York streets (account bridge approach) | 1 |
| Ralph avenue, northeast corner of Herkimer street (account of gas) | 1 |
| Railroad avenue, southwest corner of Etna street (account of gas) | 1 |
| Railroad avenue, west side, north of Etna street (account of gas) | 1 |
| Spencer street, north side, between DeKalb and Willoughby avenues (account of gas) | 1 |
| Washington street, southeast corner of Concord street (account bridge improvement) | 1 |
| Washington avenue, east side, first north of Pacific street (account of gas) | 1 |
| Total | 16 |

Lamps Temporarily Discontinued.

| Location. | No. |
|---|---|
| Prospect Park lake lights, turned off April 6 | 10 |
| Prospect Park lake lights, turned off November 17 | 10 |
| Rose garden, Prospect Park, turned off October 15 | 2 |
| Beach at Coney Island, turned off October 1 | 10 |
| Total | 48 |

Mantle Gas Lamps, New York and New Jersey Globe Gas Light Company, Brooklyn Union Gas Company's District, Entire Borough, Excepting Thirtieth and Thirty-first Wards.

| Location. | No. |
|---|---|
| Kent avenue, northwest corner of Myrtle avenue (account of electric lights) | 1 |
| Kent avenue, southeast corner of Myrtle avenue (account of electric lights) | 1 |

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| Location. | No. |
|---|---|
| Avenue M, north side, first east of East Twenty-first street (unnecessary) | 1 |
| North Ninth street, northwest corner of Roebling street (account of electric lights) | 1 |
| Rodney street, west side, first north of South Eighth street (account of electric lights) | 1 |
| Roebling street, between South Fourth and North Eighth streets (account of electric lights) | 21 |
| Classon avenue, east side, first and third south of DeKalb avenue (unnecessary) | 2 |
| North Seventh street, south side, second east of Driggs avenue (account of electric lights) | 1 |
| South Second street, south side, second east of Driggs avenue (account of electric lights) | 1 |
| South First street, south side, first east of Roebling street (account of electric lights) | 1 |
| South First street, south side, first east of Keap street (account of electric lights) | 1 |
| Washington avenue, southeast corner of High street (account of electric lights) | 1 |
| Washington avenue, northeast corner of High street (account of electric lights) | 1 |
| Broadway, southwest corner of Hewes street (account of electric lights) | 1 |
| Broadway, northeast corner of Seigel street (account of electric lights) | 1 |
| South Second street, south side, first east of Grand street extension (account of electric lights) | 1 |
| South First street, north side, first east of Grand street extension (account of electric lights) | 1 |
| South Third street, north side, first east of Havemeyer street (account of electric lights) | 1 |
| South Third street, southeast corner of Marcy avenue (account of electric lights) | 1 |
| Marcy avenue, west side, first north of South Third street (account of electric lights) | 1 |
| Ormond place, west side, first north of Fulton street (unnecessary) | 1 |
| Hancock street, south side, second east of Knickerbocker avenue (unnecessary) | 1 |
| Irving avenue, northwest corner of Jefferson avenue (unnecessary) | 1 |
| Total | 44 |
| Lamps discontinued and relighted at nearby locations | 27 |
| Lamps temporarily discontinued on account of no gas or damage to post, etc. | 167 |
| Total | 238 |

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New York and New Jersey Globe Gas Light Company, Brooklyn Borough Gas Company's District, Thirty-first Ward.

| Location. | No. |
|---|---|
| Kings highway, northwest corner of East Fifteenth street (account of electric lights) | 1 |
| Lamps temporarily discontinued on account of no gas or damage to post, etc. | 6 |
| Total | 7 |

TABLE E.

Showing Number of Outages of Electric, Gas and Naphtha Lamps Reported by Inspectors, Police and Lighting Companies During the Year 1908.

Electric Arc Lamps.

| | Edison Electric Illuminating Company. | Flatbush Gas Company. | Total. |
|---|---|---|---|
| January | 824 | 86 | 910 |
| February | 1,212 | 72 | 1,284 |
| March | 514 | 184 | 698 |
| April | 547 | 799 | 1,346 |
| May | 459 | 206 | 665 |
| June | 292 | 131 | 423 |
| July | 208 | 140 | 348 |
| August | 509 | 218 | 727 |
| September | 323 | 46 | 369 |
| October | 289 | 25 | 314 |
| November | 2,200 | 60 | 2,260 |
| December | 506 | 81 | 587 |
| Total | 7,883 | 2,048 | 9,931 |

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## Mantle Gas Lamps.

| | New York and New Jersey Globe Gas Light Company. | | Kings County Lighting Company. | Total. |
|---|---|---|---|---|
| | Brooklyn Union Gas Company's District. | Brooklyn Borough Gas Company's District. | | |
| January | 260 | 4 | 116 | 380 |
| February | 399 | 6 | 579 | 984 |
| March | 163 | 7 | 60 | 230 |
| April | 117 | 8 | 40 | 165 |
| May | 85 | 49 | 17 | 151 |
| June | 112 | 4 | 37 | 153 |
| July | 62 | 4 | 21 | 87 |
| August | 553 | 9 | 36 | 598 |
| September | 505 | .. | 82 | 587 |
| October | 183 | .. | 67 | 250 |
| November | 119 | .. | 86 | 205 |
| December | 109 | .. | 113 | 222 |
| Total | 2,667 | 91 | 1,254 | 4,012 |

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Naphtha Mantle Lamps, Welsbach Street Lighting Company of America.

| | | | |
|---|---|---|---|
| January | 5 | August | 288 |
| February | 1 | September | 199 |
| March | 2 | October | 71 |
| April | .. | November | 24 |
| May | .. | December | 26 |
| June | 2 | | |
| July | 6 | Total | 624 |

Recapitulation.

| | Electric Arc. | Gas Mantle. | Naphtha Mantle. | Total. |
|---|---|---|---|---|
| January | 910 | 380 | 5 | 1,295 |
| February | 1,284 | 884 | 1 | 2,269 |
| March | 698 | 230 | 2 | 930 |
| April | 1,346 | 165 | .. | 1,511 |
| May | 665 | 151 | .. | 816 |
| June | 423 | 153 | 2 | 578 |
| July | 348 | 87 | 6 | 441 |
| August | 727 | 598 | 288 | 1,613 |
| September | 369 | 587 | 199 | 1,155 |
| October | 314 | 250 | 71 | 635 |
| November | 2,260 | 205 | 24 | 2,489 |
| December | 587 | 222 | 26 | 835 |
| Total | 9,931 | 4,012 | 624 | 14,567 |

Note—In addition to the above, there were thirty-eight 450-watt lamps reported by the Edison Electric Illuminating Company as temporarily out of service, a total of 212 nights, on account of broken poles, which were deducted from their monthly bills.

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| Grand Totals. | Electric Arc. | Gas Mantle. | Naphtha Mantle. | Total. |
|---|---|---|---|---|
| Inspectors | 4,492 | *2,460 | 409 | 7,361 |
| Police | 6,040 | 1,597 | 364 | 8,001 |
| Total reported | 10,532 | *4,057 | 773 | 15,362 |
| Duplicates | 601 | 45 | 149 | 795 |
| Total outages | 9,931 | *4,012 | 624 | 14,567 |

* Includes fifty-four open flame gas.

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TABLE F.

Time Table for Lighting and Extinguishing Street Lamps in the Thirtieth Ward Borough of Brooklyn.

| | Begin To Light, P. M. | Begin to Extinguish A. M. |
|---|---|---|
| January 1 to 15, inclusive | 4.47 | 6.22 |
| January 16 to 31, inclusive | 5.05 | 6.14 |
| February 1 to 14, inclusive | 5.25 | 6.00 |
| February 15 to 29, inclusive | 5.40 | 5.45 |
| March 1 to 15 inclusive | 5.57 | 5.17 |
| March 16 to 31, inclusive | 6.14 | 4.53 |
| April 1 to 15, inclusive | 6.30 | 4.30 |
| April 16 to 30, inclusive | 6.45 | 4.30 |
| May 1 to 15, inclusive | 7.00 | 3.40 |
| May 16 to 31, inclusive | 7.23 | 3.24 |
| June 1 to 16, inclusive | 7.35 | 3.17 |
| June 16 to 30, inclusive | 7.40 | 3.17 |
| July 1 to 15, inclusive | 7.40 | 3.28 |
| July 16 to 31, inclusive | 7.30 | 3.40 |
| August 1 to 15, inclusive | 7.10 | 3.58 |
| August 16 to 31, inclusive | 6.50 | 4.10 |
| September 1 to 15, inclusive | 6.25 | 4.25 |
| September 16 to 30, inclusive | 6.00 | 4.40 |
| October 1 to 15, inclusive | 5.30 | 5.00 |
| October 16 to 31, inclusive | 5.10 | 5.10 |
| November 1 to 15, inclusive | 4.45 | 5.37 |
| November 16 to 30, inclusive | 4.35 | 5.50 |
| December 1 to 15, inclusive | 4.30 | 6.15 |
| December 16 to 31, inclusive | 4.38 | 6.18 |

The time allowed for lighting is forty-five minutes, and for extinguishing, forty-five minutes, from time of beginning noted above. Lamps burning a total of 3,918.12 hours.

These lamps are operated by the Kings County Lighting Company, whose contract expires December 31, 1914. Total number of lamps burning, 4,558.

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TABLE G.

Statement Showing the Number of Broken Globes, and Minor Repairs Necessary to Lamps, for Which Notices to Repair Same Were Sent to the Various Lighting Companies.

| | |
|---|---|
| Broken electric arc globes | 61 |
| Broken mantle gas lamp globes | 351 |
| Broken mantle gas lamp domes | 259 |
| Broken mantle gas lamp mantles | 1,423 |
| Broken mantle gas lamp segments | 16 |
| New mantle gas lamp canopies required | 12 |
| New mantle gas lamp ventilators required | 10 |
| New mantle gas lamp chimneys required | 525 |
| New mantle gas lamp burners required | 41 |
| New mantle gas lamp frames required | 7 |
| Defective arc lamps | 448 |
| Defective mantle gas lamps | 59 |
| Defective naphtha lamps | 4 |
| Leaking services | 9 |
| Services to be pumped out | 912 |
| Total reports and notices sent | 4,137 |

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TABLE

Showing Work Done to Public Lamp-posts at

| Location of Post. |
|---|
| Elton street, 125 feet south of Liberty avenue |
| Clermont avenue, east side, second south of DeKalb |
| Atlantic avenue, south side, third east of New York avenue |
| Bushwick avenue, northwest corner Linden street |
| Seventh street, south side, second east of Second avenue |
| Eighth street, north side, second east of Second avenue |
| State street, south side, first east of Court street |
| Wythe avenue, northeast corner North First street |
| Wythe avenue, northwest corner North Third street |
| Pitkin avenue, north side, first east of Junius street |
| Clermont avenue, east side, first north of Lafayette avenue |

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H.

the Expense of Private Parties During 1908.

| Work Done. | Party Paying for Work Done. |
|---|---|
| Removed and reset..... | S. Dunarf, No. 199 Christopher street. |
| Reset..... | Whiting, Stean Company, No. 135 Broadway, Manhattan. |
| Removed and reset..... | Arthur Stone, No. 44 Court street. |
| Removed and reset..... | Geo. Woods, No. 697 Jefferson avenue. |
| Removed and reset..... | Hicks Brothers, No. 498 Thirteenth street. |
| Removed and reset..... | Hicks Brothers, No. 498 Thirteenth street. |
| Removed and reset..... | E. L. Patterson. No. 216 State street. |
| Removed and reset..... | Iverson & Gustavson, No. 28 Second place. |
| Removed and reset..... | Iverson & Gustavson, No. 28 Second place. |
| Removed and reset..... | Thatford & Ackerman, No. 2471 Atlantic avenue. |
| Removed..... | Whiting, Stean Company, No. 135 Broadway, Manhattan. |

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## REPORT OF DIVISION OF STREET LIGHTING, BUREAU OF LAMPS AND LIGHTING, BOROUGH OF QUEENS.

Long Island City, December 31, 1908.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I submit herewith data, tables, etc., as report of the operations of this office for the year 1908.

Table "A" shows net number of lamp extinguishments reported by the Police and the Department Inspectors during year.

Table "B" shows work performed to public gas lamp-posts, at expense of private persons.

Table "C" shows, in condensed form, number of notices sent lighting companies for miscellaneous repairs.

Table "D" shows the number of private gas lamps on public highways by companies.

During the year, a total of 659 mantle naphtha lamps were discontinued and replaced by an equal number of mantle gas and tungsten incandescent lamps. The installation of 1,457 additional tungsten lamps during the year has proved a decided success, meeting with the approbation of citizens and civic societies generally, as attested by numerous letters of commendation, received at the office. It has also enabled the Bureau to place lamps at many locations where it would have been impossible to place arc lamps owing to insufficient appropriation. Requests to replace arc lamps with tungsten incandescent lamps, are becoming more frequent. The lamp units during the year were increased by approximately 1,000.

A marked improvement in the efficiency of the lighting was noticeable during the year, in that the companies gave very prompt attention to complaints. Personal observation, confirmed by the Inspectors, showed that lamps, maintained by the New York and New Jersey Globe Gas Light Company, found broken in the morning, had been repaired and were found burning the night of same day. Where circuit trouble or abnormal conditions existed at night, Inspectors 'phoned the Assistant Engineer and the General Inspector, who get in touch with the lighting companies, notifying them to give immediate attention to same, and covering the ground to see that necessary repairs were made to place lamps in proper burning condition.

During the year all the lamp-posts in the Second and Fourth Wards were painted with an orange yellow stripe, 3 inches deep, around the head of column, to indicate that same were City posts, and to readily distinguish from posts owned by lighting companies. All gas and naphtha posts in the Borough were painted and locations checked by our Inspectors, copy of such locations being furnished both gas and maintenance companies.

Early in January, 11 arc and 80 mantle gas lamps were temporarily discontinued in the Rockaways, on account of houses being closed after summer season, and where but slight traffic over roadways was apparent. These lamps were relighted on various dates during the spring and summer months, but the saving effected amounted to approximately $1,000.

The most serious problem the Bureau has to contend with, excepting lack of office room, is the demand for new lamps, the applications for which are, in the main, justifiable. It has been unable to keep pace with the rapid development of the Bor-

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rough, on account of insufficient appropriation, but has cared for a number of requests by the discontinuance of arc lamps and the substitution of tungsten incandescent and mantle gas lamps.

The floor space of the Bureau is entirely inadequate for the proper performance of even the routine work, aside from the fact that the office is located in an unsanitary building, which is also a fire trap. The office is so small that, when an Inspector reports in, the Clerk must of necessity give up his desk for the Inspector's use, or the latter must go to the office of another Bureau to get room to properly verify reports, etc. For some time, a map of the Borough of Queens, with lamps plotted thereon, has been held at the main office, pending the time when this Bureau shall have space in which to unroll it. This map is an absolute necessity, and the Bureau has been, and will be seriously inconvenienced until it has facilities for using same. Conditions will grow worse as the amount of work increases, and immediate action toward securing larger quarters is urged. It is also recommended that a Stenographer be assigned to the Bureau for its work alone. At present, the very capable departmental Stenographer devotes about two-thirds of her time to Bureau work, and, in emergency cases, either the work must be held back, or it necessitates her remaining after hours to complete it. This frequently happens, and, in justice to her, and to facilitate the work of the Bureau, the above recommendation is made.

The outside inspection force during the year practically consisted of two men; one Inspector being detailed in the office; one on special work and to cover illness, vacations, etc. This is a serious handicap, and at a glance will show how impossible it was to make proper day and night inspections. One Inspector's ordinary district is as large as the entire Borough of Richmond, and, in addition, he had to look after two wards, a total territory as large as the Borough of Brooklyn. Another Inspector had a territory nearly as large as the Boroughs of Manhattan and The Bronx combined, and rarely reached home before midnight. Notwithstanding that, conditions necessitated the men frequently working overtime, particularly in bad weather; they did so cheerfully, and deserve commendation for the interest they have taken in their work. It is pleasing to state that they have been steady, reliable and consistent, and also have the confidence of their official superiors. Their districts, however, are so large that a cut should be made in them, and it is recommended that at least three new Inspectors be added, and four if possible.

The Office Clerk, William Kalkbrenner, has been the mainstay of the office since his transfer from the main office, and I cannot speak in any too high terms of his capability and readiness to perform routine and special work. He has repeatedly remained at his desk hours after his regular time, particularly on Saturday afternoons, and, on several occasions, has spent evenings at my home, assisting with Bureau work. In emergency cases he has performed all kinds of Inspector's duties, and, when shorthanded, he has, at my request, made night inspections of new lamps installed. He is a tireless worker, thorough in every detail, and declined to take a vacation during the year, in an effort to keep up with the large amount of work he has had to do. He is, in my opinion, one of the most valuable employees, in his respective position, that the Department has.

All of which is

Respectfully submitted,

N. I. CLARKIN, General Inspector.

Approved:

Wm. G. Quirk, General Inspector of Street Lighting.

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TABLE

Showing the Net Number of Electric, Gas and Naphtha Lamp Extinguishments Month During

| Company. | January. | February. | March. | April. |
|---|---|---|---|---|
| **Electric Lamps.** | | | | |
| New York and Queens Electric Light and Power Company— | | | | |
| Arc | 1,627 | 776 | 630 | 688 |
| Incandescent | 258 | 112 | 62 | 97 |
| Queens Borough Gas and Electric Company— | | | | |
| Arc | 176 | 506 | 115 | 108 |
| Incandescent | .... | .... | .... | .... |
| Total, electric | 2,061 | 1,394 | 807 | 893 |
| **Mantle Gas Lamps.** | | | | |
| Newtown Gas Company and New York and New Jersey Globe Gas Light Company (Ltd.) | 81 | 247 | 50 | 19 |
| New York and Queens Gas Company and New York and New Jersey Globe Gas Light Company (Ltd.) | 18 | 93 | 39 | 9 |
| Woodhaven Gas Light Company and New York and New Jersey Globe Gas Light Company (Ltd.) | 13 | 12 | 3 | 15 |
| Richmond Hill and Queens County Gas Light Company and New York and New Jersey Globe Gas Light Company (Ltd.) | 2 | 13 | 3 | 3 |
| Jamaica Gas Light Company and New York and New Jersey Globe Gas Light Company (Ltd.) | 4 | 14 | 6 | 1 |
| Queens Borough Gas and Electric Company and New York and New Jersey Globe Gas Light Company (Ltd.) | 96 | 7 | 2 | 1 |
| Total, gas | 214 | 386 | 103 | 48 |
| **Naphtha Lamps.** | | | | |
| Welsbach Street Lighting Company of America— | | | | |
| Mantle | 48 | 49 | 15 | 39 |
| Total, naphtha | 48 | 49 | 15 | 39 |
| **Extinguishments.** | | | | |
| Total electric lamps | 2,061 | 1,394 | 807 | 893 |
| Total gas lamps | 214 | 386 | 103 | 48 |
| Total naphtha lamps | 48 | 49 | 15 | 39 |
| Grand total | 2,323 | 1,829 | 925 | 980 |

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A.

Reported by Department Inspectors and the Police in the Borough of Queens Each the Year 1908.

| May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|
| 871 | 520 | 622 | 558 | 289 | 300 | 413 | 684 | 7,978 |
| 79 | 60 | 102 | 73 | 77 | 146 | 106 | 143 | 1,315 |
| 113 | 270 | 316 | 68 | 67 | 336 | 21 | 153 | 2,249 |
| .... | .... | .... | .... | .... | 37 | .... | .... | 37 |
| 1,063 | 850 | 1,040 | 699 | 433 | 819 | 540 | 980 | 11,579 |
| 50 | 8 | 11 | 2,409 | 11 | 13 | 6 | 26 | 2,931 |
| 13 | 5 | 1 | 570 | 3 | 4 | 6 | 5 | 766 |
| 2 | .... | .... | 505 | 12 | 3 | 1 | .... | 566 |
| 5 | 2 | .... | 495 | 14 | 3 | 9 | 1 | 550 |
| 10 | 2 | .... | 212 | 16 | 2 | 8 | 2 | 277 |
| .... | 4 | 2 | 424 | 1 | 1 | 1 | .... | 539 |
| 80 | 21 | 14 | 4,615 | 57 | 26 | 31 | 34 | 5,629 |
| 31 | 14 | 13 | 2,707 | 1,627 | 25 | 10 | 13 | 4,591 |
| 31 | 14 | 13 | 2,707 | 1,627 | 25 | 10 | 13 | 4,591 |
| 1,063 | 850 | 1,040 | 699 | 433 | 819 | 540 | 980 | 11,579 |
| 80 | 21 | 14 | 4,615 | 57 | 26 | 31 | 34 | 5,629 |
| 31 | 14 | 13 | 2,707 | 1,627 | 25 | 10 | 13 | 4,591 |
| 1,174 | 885 | 1,067 | 8,021 | 2,117 | 870 | 581 | 1,027 | 21,799 |

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TABLE

Showing Work Performed to Various Public Gas Lamp-posts in the

| Location of Post. |
|---|
| Hillside avenue, south side, half-way between Church street and Lefferts avenue, and reset to a point 25 feet east of present location.* (Richmond Hill) |
| Forest avenue, west side, 1 north of Elm avenue, Maspeth |
| Trotting Course lane, east side, 2 south of Metropolitan avenue, and reset 8 feet north of present location. (Middle Village) |

* Not paid for, December 31, 1908.

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B.

Borough of Queens During the Year 1908, at the Expense of Private Persons.

| Work Done. | Name of Person Paying for Same. |
|---|---|
| Post removed and reset.... | John Donaldson, Hillside avenue and Sherman street, Richmond Hill. |
| Post removed and reset.... | Edward Hauff, Third street, Maspeth. |
| Post removed and reset.... | Long Island Railroad Company, Jamaica, N. Y. |

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TABLE "C."

Showing the Number of Notices sent in 1908 to the Lighting Companies of the Borough of Queens, Regarding Miscellaneous Repairs Required Upon Public Street Lamps.

| | | | |
|---|---|---|---|
| Arc globes broken | 427 | Domes broken | 18 |
| Tungsten bulbs broken | 84 | Ventilators broken | 7 |
| Arc shades broken | 2 | Lamp irons broken | 1 |
| Welsbach globes broken | 25 | | |
| Welsbach mantles broken | 24 | Total | 588 |

Pipes of lamp-posts to be cleared by use of force pump ..... 48

TABLE "D."

Showing the Number of Private Gas Lamps Located on Public Highways in the Borough of Queens, December 31, 1908—by Companies.

East River Gas Company.

| Location. | Ward. | No. |
|---|---|---|
| In front of gateway to Astoria Gas Works at pier head and East River (Consolidated Gas Company) | 1 | 2 |
| Winthrop avenue, between Hallett road and East River (Consolidated Gas Company) | 1 | *13 |
| Boulevard, east side, 150 feet north of Webster avenue (in front of Presbyterian Church) | 1 | 2 |
| Remsen street, 175 feet north of Fulton street | 1 | 2 |
| Steinway avenue, 450 feet north of Riker avenue | 1 | 1 |
| Total | | 20 |

*Dead posts.

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Newtown Gas Company.

| Location. | Ward. | No. |
|---|---|---|
| Northwest corner of Grant boulevard and Bay Fifth street | 2 | 1 |
| Southeast corner of Grant boulevard and Harbor place | 2 | 1 |
| Southwest corner of Grant boulevard and Bay Shore terrace | 2 | 1 |
| Northwest corner of Columbus boulevard and Bay Fourth street | 2 | 1 |
| Southeast corner of Columbus boulevard and Sound View terrace | 2 | 1 |
| Southwest corner of Columbus boulevard and Bay Shore terrace | 2 | 1 |
| Bay Shore terrace, 80 feet south of Manhattan boulevard | 2 | 1 |
| Southwest corner of Manhattan boulevard and Harbor terrace | 2 | 1 |
| Northwest corner of Manhattan boulevard and Bay Fifth street | 2 | 1 |
| Southeast corner of Manhattan boulevard and Bay Second street | 2 | 1 |
| Total | | 10 |

New York and Queens Gas Company.

| Location. | Ward. | No. |
|---|---|---|
| Broadway, south side, 1 and 2 east of Collins place | 3 | 2 |
| Farrington street, west side, 1 north of Myrtle avenue | 3 | 1 |
| Main street, east side, 1 north of Amity street | 3 | 1 |
| Jefferson street, 1 and 2 west of Lawrence street | 3 | 2 |
| Total | | 6 |

Woodhaven Gas Light Company.

| Location. | Ward. | No. |
|---|---|---|
| Diamond avenue, east side, 150 feet north of Poplar street | 4 | 1 |
| Diamond avenue, west side, 300 feet north of Poplar street | 4 | 1 |
| Diamond avenue, east side, opposite, south line of Ridgewood avenue | 4 | 1 |
| Total | | 3 |

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Jamaica Gas Light Company.

| Location. | Ward. | No. |
|---|---|---|
| Hutton avenue, southeast corner of Orchard street | 4 | 1 |
| Hutton avenue, southeast corner of Lake street | 4 | 1 |
| Briarwood boulevard, southeast corner, Orchard street | 4 | 1 |
| Briarwood boulevard, southeast corner Lake street | 4 | 1 |
| Gaylord avenue, southeast corner Orchard street | 4 | 1 |
| Gaylor avenue, southeast corner Lake street | 4 | 1 |
| Total | | 6 |

Queens Borough Gas and Electric Company.

| Location. | Ward. | No. |
|---|---|---|
| Lincoln avenue, west side, 1 north of boardwalk | 5 | 1 |
| Washington avenue, northeast and southwest corners of Henley avenue. | 5 | 2 |
| Washington avenue, northeast and southwest corners of Suffolk avenue. | 5 | 2 |
| Washington avenue, northwest corner of Dennison avenue | 5 | 1 |
| Dennison avenue, northeast corner of Newport avenue | 5 | 1 |
| Washington avenue, southwest corner of Montauk avenue | 5 | 1 |
| Washington avenue, southwest corner of Chester avenue | 5 | 1 |
| Washington avenue, northeast corner of Winthrop avenue | 5 | 1 |
| Washington avenue, northeast corner of Orienta avenue | 5 | 1 |
| Newport avenue, northwest corner of Orienta avenue | 5 | 1 |
| Bayside drive, northeast corner of Orienta avenue | 5 | 1 |
| Washington avenue, northwest and southwest corners of Pelham avenue. | 5 | 2 |
| Newport avenue, northeast corner of Monmouth avenue | 5 | 1 |
| Bayside drive, northeast corner of Monmouth avenue | 5 | 1 |
| Total | | 17 |

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## DRAFT OF LETTER TO THE CORPORATION COUNSEL, SUBMITTING, FOR REVISION, SUGGESTIONS OF A CODE OF ORDINANCES RELATING TO LAMP-POSTS ON STREETS.

It is found in the Code of Ordinances of The City of New York, with amendments to January 1, 1906, that the jurisdiction relating to the erection and maintenance of public street lamps is distributed between the Commissioner of Department of Water Supply, Gas and Electricity and the Borough President's office of the different Boroughs.

The ordinances relating to the public lamps are different, and can be varied in construction and interpretation, and are not alike in any two Boroughs.

I find also that, under chapter 5, Miscellaneous Ordinances, page 247, article 2, section 82, reads as follows:

"Article 2, Placards on Lamp-posts, etc.

"Section 82. No person shall attach, place or paste, or cause to be attached, placed or pasted, any sign, advertisement, notice or hand bill or other matter on any curbstone, flagstone or any other portion or part of any sidewalk or curbstone in the Borough of Manhattan, under a life penalty."

You will note that this says nothing in regard to placards on any lamppost. In other words, so far as the law is concerned to-day the lamp-posts could be used for advertising purposes all over the city.

It is obvious, therefore, that some ordinance should go through to correct an omission of this character. This omission occurred in the change from old section 730 in the following paragraph:

"No person shall attach, place or paste, or caused to be attached, placed or pasted any sign or advertisement or other matter on any public lamppost in The City of New York, or that may hereafter be so erected under the penalty named in the next section."

It is evident that the Committee of the Board of Aldermen in revising this ordinance, which consisted of the two parts above quoted separately, thought there was too much repetition, and cut the latter part, intending, in my opinion, to put in the word "lamppost" with the words "curbstone," "flagstone," etc.

As stated above, there are also a number of other matters in the different Boroughs where there is a considerable lack of concerted action, for the reason that the jurisdiction relating to the erection and maintenance of public street lamps is distributed between the Commissioner of this Department and the Borough President's office. I have therefore caused the following rough draft of ordinances to be drawn up to cover this point, and would be indebted if you would put this in correct form, or advise me if there is any objection to any given section in the matter.

In this way the matter can be reversed and put into final form, which should be introduced into the Board of Aldermen for consideration.

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Title—Be it ordained by the Board of Aldermen of The City of New York, that all ordinances of The City of New York relating to lamp or lampposts of whatsoever kind on public highways of The City of New York be repealed; and,

Be it further ordained, That the following be known as the "Corporation Ordinances relating to lamps and lampposts on public highways of The City of New York":

1. It shall be the duty of the Commissioner of Police to order the policemen when patrolling their beats to report all public lampposts in commission that are not burning, and the captain of the several police precincts shall, on observing or being informed of said lamps not burning, make a weekly report of said lamps, giving date and hours the said public lamps were observed as not burning. It shall also be the duty of the police to report the breakage or any other damage to any public street lamp or lamppost to the Commissioner of Department of Water Supply, Gas and Electricity, as soon after the breakage as possible, giving detailed particulars of cause therefor, and the names of persons, if any, responsible for same.

2. Whenever any sewer, culverts, water mains, gas mains or other pipes are to be constructed, laid, altered or repaired in any street in The City of New York in which public lampposts are erected or pipes of public lampposts are laid, or whenever any such street shall be regulated or graded, it shall be the duty of the contractor or contractors thereof to give notice of the same in writing to the Commissioner of the Department of Water Supply, Gas and Electricity, at least forty-eight hours before breaking ground at or near said public lamppost or gas pipes.

2a. It shall also be the duty of the person or persons by whom and for whose benefit any excavation is to be made for constructing, altering or repairing a sidewalk or vault, or for laying a private sewer or for other construction work in any street of The City of New York to give notice thereof in writing to the Commissioner of Water Supply, Gas and Electricity, at least 48 hours before the time of breaking ground, if said excavation is to affect, in any way, any public street lamppost, pipes or other connections thereto, and all permits issued under the jurisdiction of the Borough President for such excavation shall be countersigned by said Commissioner of Department of Water Supply, Gas and Electricity, conditioned, however, that the person or persons to whom the permit is granted for such excavation agrees, in writing, to compensate the said Department of Water Supply, Gas and Electricity for whatever damages may be caused as a result of his or their work to any public street lamp, or lamppost, or pipe, or other connections thereto.

3. It shall be the duty of the policemen to enforce the provisions of the foregoing sections (2 and 2a), and it shall be the duty of the captains of the several police precincts on observing or being informed of the opening of or excavation of any street or any avenue near any public lamppost or pipes thereof, to require the person making such opening or excavation to exhibit to him the authority or permission for such opening, and if none has been given by the proper officer, or if the exhibition

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thereof be refused, said captain of police shall, without delay, make complaint to the Corporation Counsel, and report the same to the Commissioner of Water Supply, Gas and Electricity, and to the President of the Borough in which the violation occurs.

3a. It shall be the duty of said Commissioner of Water Supply, Gas and Electricity, whose lampposts or other pipes and connections are about to be disturbed by the construction, alteration or repairing of any sidewalk, vault, sewer, water-main or pipes, or the regulating or grading of any street, on receipt of the notice provided for in sections 2 and 2a, to remove or otherwise protect and replace the said lampposts, pipes and connections, where necessary, during the process of the work at the request of the Borough President.

Penalty—4. For the violation of any of the above ordinances Nos. 2, 2a and 3, the penalty inflicted shall be the payment for all repairs and damage to posts, to the Department of Water Supply, Gas and Electricity, by the party or parties violating the same.

5. All persons are forbidden to open any street pavement and cut any pipes or connections to any public lampposts unless with the written permission of the Commissioner of the Department of Water Supply, Gas and Electricity and the Borough President, under the penalty of twenty-five dollars ($25) for each offense.

6. It shall be the duty of every person or persons who shall erect a bridge or scaffold, or other temporary walk or structure on account of certain work to be conducted upon any building or other premises within any street of The City of New York, or on or over the sidewalk thereof where the passengers may travel on or underneath said structure, to properly light the same at their own cost and expense during all the time that said structure shall be on or over the sidewalk, and the said lighting shall be done to the satisfaction of the Commissioner of Water Supply, Gas and Electricity, and the said lamps to burn during the hours prescribed for the public street lamps to burn.

6a. No person shall erect any awnings or sheds over the sidewalk of any street or avenue in The City of New York of insufficient height to allow the gas lamp-post and lamp, or other types of lamps of equal height, to be placed thereunder and properly operated.

7. It shall be the duty of the Borough President and the Commissioner of Department of Water Supply, Gas and Electricity, when any of the work referred to in any of the preceding sections shall be performed, by any persons, whether or not they are under contract with the corporation for the same by virtue or permission duly attained, to see that the requirements in regard to erecting the necessary lights be complied with, and to make the necessary complaint to the Corporation Counsel for any omission on the part of the persons referred to, under the penalty of fifty dollars ($50) for every neglect.

8. No lamp or lamp-post or illuminating sign, either plain or ornamental, shall be erected or put up in any of the streets, roads, lanes or highways in The City of

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New York, unless under the direction of the President of the Borough, and the Commissioner of the Department of Water Supply, Gas and Electricity, under a penalty of twenty-five dollars ($25), for every lamp, lamp-post or illuminating sign, and all lamps, lamp-posts and illuminating signs which will hereafter be erected will be allowed to remain in place only at the pleasure of the Commissioner of the Department of Water Supply, Gas and Electricity and the Borough President.

9. No private ornamental lamp-post, however, shall hereafter be erected in any of the streets, avenues or public places in The City of New York, which shall exceed in dimensions at the base more than eighteen (18) inches in diameter, if circular in form, and if upon a square base, no side thereof shall exceed eighteen (18) inches.

10. No person or persons shall take down or remove or permit to be taken down or removed, any public lamp or lamp-post now or hereafter to be placed in front of their premises for the purpose of constructing a vault, or any excavation work, blasting, or otherwise, without the permission of the President of the Borough, countersigned by the Commissioner of the Department of Water Supply, Gas and Electricity, and the said person or persons conducting said work shall cause the lamp-post so removed to be reset immediately upon the completion of his or their work, under penalty of twenty-five dollars ($25) for each offense. The expense for the removing and resetting of each lamp-post shall be borne by the person or persons for whose accommodation the same is done.

11. No person or persons shall attach, place, paint, print, nail, paste or mutilate, or cause to be attached, placed, painted, printed, nailed, pasted or mutilated, or in any way encumber any street lamp or lamp-post, with any sign, advertisement, notice, hand-bill, poster, or other foreign matter or material of whatsoever kind, under a penalty of ten dollars ($10) for each offense for lamp-post as encumbered.

12. No person shall climb any public street lamp-post or hang or hitch any ropes, chains, ladders or other devices to same, under penalty of five dollars ($5) for each offense.

13. It shall not be lawful to erect any telegraph post within a distance of ten feet of any public street lamp, any person offending against any of the provisions of this section shall be deemed guilty of a misdemeanor, and on conviction thereof before any of the Police Magistrates or Justices of the City, and shall be punished by a fine not exceeding ten dollars ($10), or in default of the payment of said fine, by imprisonment not exceeding ten days.

Section 1953 of the New York Consolidation Act of 1882—If any person shall negligently or wilfully break, take down or carry away any glass lamp hung or fixed in any of the streets in The City of New York, or extinguish the lights therein, or by aiding or abetting in the same, shall be subject to a fine of twenty-five dollars, and in default of payment of such fine, the offender shall be committed to the penitentiary for the term of ten days.

Commissioner.

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## REPORT OF THE DIVISION OF PUBLIC BUILDINGS, BOROUGHS OF MANHATTAN AND THE BRONX.

New York, May 18, 1909.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I submit herewith a report of the supply of gas and electric current for light, heat and power purposes to the public buildings in my charge and under your direction for the year ending December 31, 1908.

This year, like that of the year 1907, was in a large measure devoted to the work of reviewing and revising plans and specifications indicating the nature, number and distribution of lights proposed for installation in the various new buildings and likewise in alterations or additions to existing buildings. Particular attention was required for the 115 buildings either existing or in the course of construction on Blackwells Island operating under the jurisdiction of the Department of Public Charities.

Another special feature of the work of that year was the close attention given to the question of placing our public buildings in a safe condition electrically. During the year 1907 numerous electrical violations were found to exist throughout many of these structures, and by reason of the fact that they could not receive the necessary special examinations that they required on the part of the Electrical Bureau of this Department, such of our Lighting Inspectors as could be spared were temporarily assigned to this duty, who by the force of their knowledge and experience in this particular class of work were specially fitted to give proper attention to the same, with a view to ascertaining in detail the nature and location of the defective electrical conditions existing therein and formulating such reports for transmission to the heads of the various Departments, in order to have these structures placed in an absolutely safe operating condition. As a result of these investigations, it was found that many of the electrical equipments of the public buildings were in such a defective condition as to place the structures in imminent danger of destruction by fire, and when the reports heretofore referred to were fully and properly formulated they were transmitted to the heads of the respective Departments operating these buildings with instructions that this Department would require immediate attention to the same, or the current would have to be discontinued to these buildings by the authority vested in this Department. Accordingly, we succeeded in having these structures renovated to such an extent as to remove them from the danger zone, and in many cases we took advantage of the situation, where wiring had to be done, to have the lighting conditions improved where such were required. This work was conducted, as I have just stated, by the Inspectors of this office without any additional help other than that originally assigned to public buildings during the the year 1906, and this state of affairs existed until November 1, 1908, when a few additional Inspectors were added to the force, and by your instructions

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a special squad of Electrical Inspectors were created, the same being obtained from a new eligible list brought into existence through a Civil Service examination for Inspector of Light and Power, held on May 12, 1908, this special force by your directions operating under your personal supervision, the General Inspector of Public Buildings being relieved of this responsibility, owing to the rapidly increasing burden of the work devolving upon this office. When, on November 1, 1908, as I have just stated, you assigned to me from the Civil Service list heretofore referred to, four additional men, thus making my total equipment of Inspectors eight (8) men, I detailed one of these men to working up the details of the public building lighting plans under my directions, assigning the remaining three (3) men, together with those already at work, to the outside, or public building, inspections.

The same system of tri-weekly night inspections, together with daily inspections of the public buildings, that prevailed during the year 1907, and as described in my report of that year, still continued with very gratifying results, important improvements continuously being made, not only in the efficient and economical illumination of the various public buildings, both by gas and electricity, but likewise the supply of gas and electricity for heat and power purposes. These Inspectors have received a rigorous and thorough training in the method of inspecting and submitting reports on the lighting conditions in the various public buildings in their respective districts, together with instructions as to the submitting of suitable recommendations to the General Inspector of Public Buildings as would tend to equip those structures with an efficient and economical system of lighting.

Another important feature of the year was an exhaustive test of mantle lighting, both upright and inverted, that was conducted under the supervision of this Department in one of the public schools, with a view to illustrating the efficiency and economy, not only of the incandescent system of lighting as compared with the open flame method of illumination, but likewise by means of this test enabling this Department to ascertain the comparative efficiencies of the respective mantle burners placed in competition under the provisions of this test, one with another. The results of this test more than fulfilled our anticipations, and clearly demonstrated the fact that these mantle lights, while affording 66⅔ per cent. more candlepower than the open flame lighting, at the same time consumed less than one-half the amount of gas required by the said open flame burners. Accordingly, the Department of Education was presented with a full statement of the results of this test, with the recommendation, and, in fact, earnest request that those schools lighted exclusively by means of gas be immediately equipped with such mantle lights as we recommended, and that the same be operated on a maintenance basis to insure their efficient and economical working.

Owing to the very recent introduction of high efficiency electric lamps in the market, combined with the very improved form of reflectors, both glass and metal in nature, splendid opportunities were afforded this office to recommend superior forms

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of illumination in our public buildings than was ever heretofore possible. The various City Departments, therefore, realizing our powers under the Charter, and as interpreted by the many decisions of the Law Department, immediately proceeded to put into force these recommendations, with the result, I am most pleased to report, that many of the public buildings, both old and new, are now equipped with forms of illumination that do credit to the City.

In order, however, to continue this good work which has been started so well on its way during the year just closed, experience has clearly demonstrated the fact that owing to the rapidly increasing applications that are being made to this office for the review of plans of new buildings proposed for erection in the immediate future, together with renovations of and additions to existing buildings, it is absolutely essential that the present force of this office be materially increased.

As a brief illustration of the rapidity with which the work attendant to the care of the public buildings is increasing, I beg leave to draw your attention to the fact that after a full count of the buildings under our jurisdiction in the two Boroughs, Manhattan and The Bronx, in the year 1903, there were found to exist a total of 600 buildings, whereas, to-day, a period of but six years, this total has increased to 830 buildings, with a complement of 315,692 lights, thereby showing an increase in buildings of 38 per cent. As it is to-day, each Inspector is required to look after the supply of gas and electric current for light, heat and power purposes to an average of 140 buildings. Under the system of tri-weekly night inspections, it is impossible to exercise efficient control of these buildings, as over 90 per cent. of the same in each man's district is operated at night, thus affording an Inspector an opportunity of seeing each building on an average of but four times a year. Experience in the past has clearly illustrated the fact that the frequent presence of an Inspector in a building at night carries with it a remarkable moral force, almost invariably resulting in a more efficient and economical use of gas and electric current therein. Were this carried out on the efficient basis so much desired and herein recommended, the result would be that not only would our buildings be operated on a more efficient basis than at present, but large sums of money would be saved to The City of New York, thus affording sufficient funds to further the work of this Bureau. Therefore, in view of these facts, I would most respectfully recommend that six (6) additional men, if possible, and at least four (4), be added to my present force. At the present time there exists a Civil Service eligible list of 78 men, the personnel of which I am to a great extent conversant with, and, as a consequence, have reason to believe that men could be selected from the said list who would prove of great advantage to this Department.

Attached herewith are the following tabulated statements:

Table A gives the total number of gas lights and appliances installed in the public buildings of the Boroughs of Manhattan and The Bronx during the year 1908.

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Table B gives the total number of electric lights and appliances installed in the public buildings of the Boroughs of Manhattan and The Bronx during the year 1908.

Table C gives the total number of gas lights and appliances in the public buildings of the Boroughs of Manhattan and The Bronx on December 31, 1908.

Table D gives the total number of electric lights and appliances in service in the public buildings of the Boroughs of Manhattan and The Bronx on December 31, 1908.

Table E gives a comparative statement of the number of 50-watt electric light equivalents and 5-foot open flame gas burner equivalents in service during the years 1907 and 1908 in the public buildings of Manhattan and The Bronx, together with the percentage of increase or decrease in 1908.

Table F shows the number of gas regulators in commission under the contract with the Gas Consumers' Association in the Boroughs of Manhattan and The Bronx for the year 1908, together with a memorandum of the work done and material furnished by them.

Table G gives the total number of meters, both gas and electric, set, exchanged and removed during the year 1908 in the public buildings of Manhattan and The Bronx.

Table H shows the number of inspections of the public buildings of Manhattan and The Bronx made during the year 1908 by our Inspectors.

## Armories.

First Battery Armory—The new system of illumination for the targets used for sub-calibre practice, which was planned in the latter part of 1907, has been installed and is giving perfect satisfaction. No action has been taken toward improving the lighting of the drill hall other than to file plans, which are now receiving our attention. It is not probable that the new lighting equipment will be installed until the latter part of the coming year. Upon close examination of the electrical equipment of this building, it was found that considerable temporary wiring and additional lighting had been installed, which placed the building in an extremely hazardous condition. This condition was brought to the attention of the Armory Board, with the result that the defects in the electrical installation were removed.

Second Battery Armory—In view of the fact that the new armory for this Battery has been started and will probably be finished late in the coming year, it was not considered advisable to make any suggestions tending toward the improvement of the lighting conditions in the old structure at No. 1891 Bathgate avenue. Plans of the new building were submitted to this office and the outlets for the fixtures properly designated. The fixture sketches will be submitted during the coming year when the building is near completion.

Seventh Regiment Armory—The only improvement in this building has been to equip the fixtures throughout with the more modern 20 candlepower Gem lamp.

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When these lamps were first installed, considerable trouble was experienced owing to lamps of improper range of voltage being delivered; this trouble was overcome, however, by furnishing lamps of the proper voltage range. As mentioned in our report of 1907, we proposed to take up the question of installing an entirely new lighting installation for the drill hall, but in view of the fact that it is proposed to make extensive alterations during the coming year, it was considered advisable to defer the improvement until the alterations were under way.

Eighth Regiment Armory—It was found that the system of open flame gas lighting was inadequate in the gymnasium, and some improved form of lighting was required. The question of installing mantle lights was taken up not only for the gymnasium, but for other parts of the building. It is probable that these lights will be installed during the ensuing year. The drill hall of this building is lighted by gas mantle lights, and after making photometric tests it was deemed advisable to request the Armory Board to install a system of electric arc lighting supplemented with gas mantle lights. While no action has been taken up to the close of the year, it is hoped that the work will be completed during the ensuing year.

Ninth Regiment Armory—The new system formulated by this Bureau, mentioned in previous annual report, for illuminating the drill hall by means of arc lights, supplemented with an auxiliary system of mantle lighting has not been installed. The Armory Board has stated that they are unable to take this improvement up owing to the lack of the necessary funds, but they expect to do so during the coming year.

Twelfth Regiment Armory—The three-story addition to this building has been completed and the system of illumination designed by this Bureau has been installed and is giving satisfaction. The entrances to this building were not properly lighted, and at the suggestion of this office electric arc lamps were installed on suitable brackets over the three entrances. This work was planned and request made of the Armory Board for its installation in the latter part of 1907, but owing to the lack of funds it was not possible to have it done until the past year.

Twenty-second Regiment Armory—As this armory is to be vacated on the completion of the new building at Washington Heights, it was not considered advisable to make any more changes than were absolutely necessary. However, the electrical equipment of the old building was found to be in such poor condition, that it was deemed necessary to ask the Armory Board to make such repairs as would place it in a safe condition. At the request of the Armory Board electric lighting was substituted for gas for illuminating the exterior of the building, which, when completed will afford excellent results. Sketch plans of the new building have been filed with this office, but as the definite plans have not been filed we have been unable to take final action in the matter. It is our effort to make this the best lighted armory in the United States.

Sixty-ninth Regiment Armory—As the drill hall of this armory was not equipped with an adequate system of emergency gas lighting, it was considered advisable to

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devise and request the Armory Board to install a system of gas mantle lamps to be used in conjunction with the electric arc lamps. This precaution was taken owing to the fact that should the electric lighting fail, the building would not be left in total darkness, and thus avoid a panic. These mantle lamps have been installed and the color of the light blends very nicely with that of the arc lamp. The candle power has been increased materially and a saving over and above the cost of maintenance of $400 per annum has been effected.

Seventy-first Regiment Armory—The system of gas mantle lighting which was formulated and forwarded to the Armory Board for installation on the fixtures in the drill hall of this building has been installed; our specification has been followed out, and I am glad to report that the installation is satisfactory. In addition a number of minor changes were made in the lighting of the Veterans' room and the Major's room.

United States Ships "Granite State" and "Wasp"—Arrangements have been made for the supply of electric current to these two boats at the pier foot of West Ninety-seventh street. The "Newark," which was loaned by the United States Government, for use by the Naval Militia, has been recalled and replaced with the "Wasp." These boats are now both lighted by electricity by this Department.

Bellevue and Allied Hospitals.

Inasmuch as the aggregate number of buildings of Bellevue Hospital consumed a very large amount of current, overtures were made to the United Electric Light and Power Company for a wholesale rate on all curent consumed for both light and power in the entire group of buildings. In consequence, this Department is now supplying current to the group of buildings and obtaining the wholesale price on the current, which necessitates that Bellevue and Allied Hospitals supply their own incandescent lamps and also trim their arc lamps. This arrangement has resulted in a very large saving to this Department over the cost of supplying current to these buildings the year previous.

New Pavilions A and B—The plans for this building were reviewed and approved by this Bureau during the latter part of 1906, and frequently revised during the year 1907, owing to architectural changes. The work during this year has progressed very rapidly and satisfactorily and the premises were formally occupied in October. The system of illumination planned by this Bureau appears to be satisfactory in every respect, in fact, this is now considered one of the best lighted buildings of its class in the City.

Pathological Laboratory—Preliminary plans of this building were reviewed and approved in accordance with the request of the consulting engineers during the latter part of 1907. The definite plans for this building were submitted early in this year and were duly approved. The work is now progressing rapidly and it is probable that the building will be ready for occupancy toward the latter part of the coming year.

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Boiler House and Coaling Station—This is also one of the new buildings of the Bellevue group, for which plans were filed during this year and approved by this office. It is probable that the building will not be ready for occupancy until late in the coming year.

Training School for Women Nurses—The preliminary plans and specifications for this building were submitted to this office for review during the latter part of the preceding year. As stated in my previous report, this work was proceeded with by the hospital authorities without obtaining the full approval of the plans by this office, with the result that the sum of $5,200 was required to be expended over and above the original contract. We have, however, kept careful watch on this building during construction and have modified our recommendations where necessary, owing to structural changes, with the result that the lighting equipment of this building is one of the most satisfactory examples of illumination of buildings of this character that can be found in this city.

Male Nurses' Home—The lighting of this building was found to be in an extremely poor condition owing to the fact that improper arrangements had been made for heating the same. As the building was not equipped with an adequate steam heating plant, gas radiators were installed in the dormitories throughout the building. As the building was not piped with the intention of using gas for heating, the result was that the lights were extremely poor throughout the building. After considerable delay and correspondence with the Bellevue authorities, we succeeded in having a system of gas mantle lamps installed and the gas radiators removed. The building is now very well lighted, the mantle lamps having been placed on a rental maintenance basis, in accordance with the suggestions of this Bureau. The lighting is as near perfect as conditions will permit.

Annex to Nurses' Home, No. 200 East Twenty-seventh Street—Owing to the crowded condition of the Nurses' Home, attached to Bellevue Hospital, it was found necessary to lease an apartment at the above address. As this was merely for dormitory quarters until the completion of the new Nurses' Home, it was not considered advisable to make radical changes in the lighting of the premises other than to install a system of mantle lights.

"Southfield"—This vessel was obtained from the Department of Docks and Ferries, to be used as a day pavilion for tuberculosis patients. As the existing lighting of the boat was found to be not at all suited for its new use, this Department found it necessary to make many changes in the method of illumination. Owing to the failure, therefore, on the part of the Bellevue Hospital authorities to obtain the necessary funds, it is not probable that the work will be enforced until late the coming spring.

Harlem Hospital—Plans for the Nurses' Home, connected with this hospital, have been submitted to this Department for review. As these are preliminary plans, our

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final approval will be withheld until the definite plans have been submitted. As to the hospital, the installation is new and modern and it has not been found necessary to make any changes, except in a number of places additional lights have been installed.

Fordham Hospital—As this is also a new and modern building, the only work that has been done consisted of the installation of a few additional lights in the kitchen and a number of changes and additional lights in the workshops, storehouse and drug store.

I regret to state, however, that many of the suggestions of this Bureau were not followed in the lighting of this building, with the result that it will be necessary to request a number of changes in the near future.

Numerous additional lights and changes to existing lighting were made in the various buildings of Bellevue Hospital. While these changes were suggested with an idea to improving the lighting conditions, we have not always received the support of that Department which we considered we were entitled to, with the result that many important suggestions made by this office have not been enforced.

## Bridges.

Central Bridge—The system of electric lighting which was planned by this Bureau in the latter part of 1907 has been installed and current is now supplied.

Pelham Bay Bridge—Current was supplied to the motors operating this bridge, also for lighting the small houses on the approaches to the same.

University Heights Bridge—This bridge was opened and current supplied for operating the motors, as also for lighting the engine room and tenders' shelter houses.

## Public Charities.

The work of this Department has been by far the most important in this office during the past year. Plans have been filed for review and approval for new buildings in the Metropolitan, City Hospital and City Home for the Aged and Infirm districts, together with plans for the wiring of existing buildings for electric lighting. The work of planning the systems of illumination has been a very large task owing to the fact that the plans, in many instances, were submitted in blank form, and the methods of illumination had, therefore, to be designed by this office. This work entailed numerous visits to the buildings in question, and I am fully confident that when these buildings have been completed, they will be very creditable examples of illumination of buildings of this character.

## Correction.

This Department has not undertaken work of any magnitude. Many small additions to the lighting equipment have been made in the various buildings under the jurisdiction of the above named Department, and defects reported by our Inspectors have received prompt attention.

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We expect, however, that a great work is about to be undertaken by the Department of Correction in the erection of a very large Penitentiary on Rikers Island, to cost approximately $4,000,000, and to be operated in lieu of that institution now located on Blackwells Island. Arrangements have been made by which plans and specifications for this structure will be submitted to this office, and the electric equipment for light, heat and power purposes will be installed in accordance with the recommendations of this Department.

College of The City of New York.

This group of buildings has been completed and occupied. The current is supplied by a plant supplemented with gas for emergency lighting. A more detailed report of this group of buildings is contained in our previous annual report..

Education.

The particular work in this Department for the year has been the inspection of the electrical equipments of the public schools, many of which were found to be in such a dangerous condition that notice was sent to the Department of Education to the effect that if the necessary repairs were not made at once, this Department would be compelled to discontinue the supply of current. In only one case, however, was it found necessary to take this action, viz.: Public School 7, where current was discontinued for a period of a month while the necessary repairs were being made. While only the most dangerous installations have been corrected up to the present time, there are still many buildings which are in a more or less dangerous condition electrically.

The work of this Department occupies a great deal of the time of this office owing to its large number of buildings and the numerous small changes and additions to the installations. We have consulted with this Department as to the lighting of the new, future buildings and have decided upon a general system of lighting. While this arrangement has not been perfected it is merely a guide to that Department in the planning of their new buildings.

In a number of the gas lighted schools which were equipped with gas mantle lamps, it was found necessary to remove the same owing to the unskilled attention these mantle lamps received.

In order to demonstrate to this Department that a much better illumination would result by the use of these mantle lamps when properly cared for, and considerable saving in gas would be made, we conducted a competitive test of the burners of the different manufacturers in Public School 43. The results of this test were submitted to the Department of Education, but up to the present time no definite action has been taken by that Department. It is hoped, however, that after the necessary funds can be obtained by them that suitable systems of mantle lamps will be installed, in not only the gas lighted buildings, but also those lighted by electricity, where mantle lamps will be installed on the exits and in the corridors.

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The work of equipping the electrically lighted schools with the more modern type of lamp, viz., the Gem, is progressing in a very satisfactory manner, and it is hoped that by the middle of the coming year all the school buildings will be equipped with this type of lamp.

This Bureau is still continuing its endeavors to cause the removal of all forms of gas appliances for heating purposes. We have not, however, been altogether successful in this effort, as the Department of Education claim that they have not sufficient funds at their disposal to carry out our request. We have reason to believe, however, that this wasteful method of heating will be eliminated.

## Fire.

During this year a total of about eighteen (18) plans for alterations to existing buildings or new buildings, including the additional alterations to fire headquarters, have been received, revised and finally approved by this Department. While some of this work has been started, it is not expected that the major portion of same will be completed until the middle of the coming year.

As the buildings of the Fire Department are regularly inspected at night by our Inspectors, a large number of changes of minor character have been made, all of which tend to improve the lighting conditions.

Owing to the continued trouble with the steam heating apparatus in the quarters of Hook and Ladder 10, it was decided that in order to avoid heating the building by gas, it would be cheaper for the City in the end to make connections with the New York Steam Company's main. This service has been completed and is giving perfect satisfaction.

The quarters of Engine 78, located at the foot of Gansevoort street, were completed in the early part of this year, and the necessary arrangements made for the supply of gas and electricity.

We have not received from the Fire Department the co-operation we desire in the enforcement of this work, owing to the fact that they have been greatly hampered by the lack of the necessary funds.

## Health.

There has been but little new work in this Department during the year. The buildings and alterations to buildings which were approved the year previous have been finished, and the necessary gas and electric connections completed.

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## Parks.

Plans and specifications were received for alterations and additional lighting in the arsenal, also for the new tool house and comfort station at St. Nicholas terrace, milk booth at Tompkins Square Park, public comfort station in the Ramble, public comfort station under Riverside drive and workshop at Eighty-sixth street and Transverse road. All of these plans were submitted in blank form and the nature, number and location of the lights designated on the same by this office. As the greater portion of this work was approved very late in the year, it is not probable that any of the buildings will be ready for occupancy until the middle of the coming year.

## Police.

Plans for the fixtures in the new Police headquarters, No. 300 Mulberry street, were submitted to this office for review and approval. These sketches have been carefully reviewed, revised and finally approved by this office. The building will probably be ready for occupancy by the first of June of the coming year.

Plans and specifications were also submitted for review and were revised and finally approved of the First Precinct Police Station, Second Precinct Police Station, Twenty-third Precinct Police Station, the Branch Detective Bureau at No. 17 Allen street and No. 104 West Fifty-second street; Traffic Precinct B, No. 36 East Ninth street; Harbor Precinct B, No. 533 East One Hundred and Twentieth street, and the Traffic Squad Stable at No. 153 East Thirty-second street. All of these plans have been carefully reviewed and formally approved by this Bureau, and, in fact, in the majority of the above cases, the form of illumination originated in this office.

Specifications for the installation of gas mantle lamps to be installed and operated on a maintenance basis were formulated and forwarded to the Police Department for the Seventh, Tenth and Thirteenth Precinct Police Stations. While no action has been taken by the Police Department toward carrying out our suggestions, it is hoped that some favorable action will be taken during the ensuing year.

In addition to the above work, a large number of minor additions to the existing lighting equipments in the various buildings, together with defects reported by our inspectors, have received the necessary attention.

## Public Buildings and Offices.

During this year plans and specifications were submitted for the following buildings: First District Municipal Court, Second District Municipal Court, Sixth District Municipal Court, additional lighting in the Criminal Courts Building, additional lighting in the Rivington Street Bath, and Bureau of Highways and Sewers, Borough of

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The Bronx. All of these plans have been reviewed and the lighting systems laid out and noted on the plans.

Specifications were formulated and forwarded to the Bureau of Public Buildings and Offices for the installation of gas mantle lamps in the City Court Building, which in the main has proven very satisfactory, affording a very much improved illumination.

In addition to the above, permission was granted for the installation of additional lights in the various buildings, and many defects were reported by our Inspectors and brought to the attention of the above named Bureau.

It was found necessary in a number of cases, where plans of buildings had been approved some time ago, to make a number of changes in the method of the lighting, owing to the progress made in the science of illuminating engineering.

### Sheriff's Office.

Ludlow Street Jail—Specifications were formulated by this Bureau for the installation of a system of gas mantle lights on a maintenance basis in this jail, but owing to the question as to whether this building came under the jurisdiction of the Sheriff or of the Bureau of Public Buildings and Offices, nothing has been done toward carrying out our suggestions. The matter has been finally drawn to the attention of the Corporation Counsel, who has decided that this building is to be maintained by the Sheriff, and inasmuch as that office has not the necessary funds to carry out our recommendations, the matter will probably receive attention during the coming year.

### Street Cleaning.

Plans for the incinerator plant at Delancey street, stable R and section station at No. 610 Water street, were filed with this office for review and approval. These plans were filed in blank and the lighting installations were laid out by this office. As these plans were approved very late in the year, it is not probable that any of the buildings will be ready for occupancy before the first of the year.

In addition to the above buildings, many changes have been made to the existing lighting equipments and defects which were noted by our Inspectors have been brought to the attention of the above Department for correction.

### Water Supply, Gas and Electricity.

The lighting of certain sections of the pumping stations located at Ninety-eighth street, One Hundred and Seventy-ninth street and Jerome avenue, was found to be inadequate and giving such poor satisfaction that some immediate action was necessary. Inasmuch as these buildings were supplied by gas only, it was decided that the best immediate results could be obtained by installing a system of gas mantle lighting. Accordingly specifications were formulated and the system installed.

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A system of gas mantle lighting was also installed in the office of the Bureau of Lamps and Lighting, at No. 4113 Third avenue.

In addition to this a specification was formulated for the installation of gas mantle lamps of the inverted type in the residence of the Gate Keeper at Central Park. Up to the close of the year this installation has not been completed, but it is hoped that the same will be completed during the coming year.

Respectfully submitted,

F. J. McGUIRE, General Inspector Public Buildings.

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TABLE

The following table shows the number of buildings in Manhattan and The Bronx together with the total number of gas lights and appliances installed in those buildings

| Name of Department. | Number of Buildings. | Open Flame Burners. | Mantle Burners. | Bunsen Burners. |
|---|---|---|---|---|
| Armories | 12 | .... | .... | .... |
| Bellevue and Allied Hospitals | 36 | 30 | 60 | .... |
| Bridges | 9 | 17 | .... | .... |
| Charities | 106 | 27 | .... | .... |
| College of The City of New York | 7 | .... | .... | .... |
| Correction | 19 | .... | .... | .... |
| Education | 230 | 7,138 | .... | 6 |
| Fire | 128 | 190 | .... | 2 |
| Health | 20 | .... | .... | .... |
| Normal College | 2 | .... | .... | .... |
| Parks | 44 | .... | .... | .... |
| Police | 60 | 611 | .... | .... |
| Public Buildings and Offices | 66 | 114 | .... | .... |
| Sheriff's Office | 1 | .... | .... | .... |
| Street Cleaning | 63 | 137 | .... | .... |
| Tenement House | 1 | .... | .... | .... |
| Water Supply, Gas and Electricity | 26 | 136 | .... | .... |
| Total | 830 | 8,400 | 60 | 8 |

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A.

under the supervision of the Bureau of Lamps and Lighting during the year 1908, during that year:

| Ranges. | Steril-izers. | Hot Plates. | Water Heaters. | Pumps. | Engines. | Radiators. | Clothes Dryers. | Gas Logs. |
|---|---|---|---|---|---|---|---|---|
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 14 | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 1 | .... | .... | .... | .... | .... | .... | .... | .... |
| 1 | 1 | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 38 | .... | 343 | 2 | 12 | 9 | 16 | .... | 2 |
| .... | .... | .... | 4 | .... | .... | .... | 3 | .... |
| .... | .... | 3 | .... | .... | .... | 1 | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | 4 | .... | .... | .... | 3 | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 54 | 1 | 350 | 6 | 12 | 9 | 20 | 3 | 2 |

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TABLE

The following table shows the number of buildings in Manhattan and The Bronx together with the total number of electric lights and appliances installed in those

| Name of Department, | Number of Buildings. | Arc Lamps. | 4 C. P. Incandescent. | 8 C. P. Incandescent. | 16 C. P. Incandescent. | 20 C. P. Incandescent. |
|---|---|---|---|---|---|---|
| Armories | 12 | 4 | 60 | 60 | .... | 20 |
| Bellevue and Allied Hospitals | 36 | .... | .... | .... | .... | 1,600 |
| Bridges | 9 | .... | .... | .... | .... | 98 |
| Charities | 106 | .... | .... | .... | .... | 3 |
| College of The City of New York | 7 | .... | .... | .... | .... | .... |
| Correction | 19 | .... | .... | .... | .... | .... |
| Education | 230 | 4 | .... | .... | 1,221 | 17,348 |
| Fire | 128 | .... | .... | .... | .... | 262 |
| Health | 20 | .... | .... | .... | .... | 226 |
| Normal College | 2 | .... | .... | .... | .... | .... |
| Parks | 44 | .... | .... | .... | .... | .... |
| Police | 60 | .... | .... | .... | .... | 502 |
| Public Buildings and Offices | 66 | 16 | .... | .... | .... | 569 |
| Sheriff's Office | 1 | .... | .... | .... | .... | .... |
| Street Cleaning | 63 | 5 | .... | .... | .... | .... |
| Tenement House | 1 | .... | .... | .... | .... | .... |
| Water Supply, Gas and Electricity | 26 | .... | .... | .... | .... | 390 |
| Total | 830 | 29 | 60 | 60 | 1,221 | 21,018 |

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B.

under the supervision of the Bureau of Lamps and Lighting during the year 1908, buildings during that year:

| 32 C. P. Incandescent. | 40 C. P. Incandescent. | 50 C. P. Incandescent. | 75 C. P. Incandescent. | 100 C. P. Incandescent. | Cooper-Hewitt Lamps. | Stereopticons. | Motors. | Sterilizers. |
|---|---|---|---|---|---|---|---|---|
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 14 | 2 |
| 4 | 1 | .... | .... | .... | .... | .... | 7 | .... |
| .... | .... | 3 | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 2 | .... | .... | .... | .... | .... | 1 | 28 | .... |
| .... | .... | 1 | .... | .... | .... | .... | 2 | .... |
| .... | 1 | .... | 5 | 6 | .... | .... | 11 | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | 8 | .... | 1 | .... | .... | .... | .... |
| .... | 21 | 9 | .... | 4 | .... | .... | 4 | .... |
| .... | .... | .... | .... | .... | .... | .... | 2 | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 6 | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | 16 | .... | 26 | .... |
| 6 | 23 | 21 | 5 | 11 | 16 | 1 | 100 | 2 |

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TABLE

The following table shows the number of buildings in Manhattan and The Bronx together with the total number of gas lights and appliances in service in those buildings

| Name of Department. | Number of Buildings. | Open Flame Burners. | Mantle Burners. | Bunsen Burners. | Arc Lamps. | Ranges. |
|---|---|---|---|---|---|---|
| Armories | 12 | 7,317 | 2,057 | 3 | 2 | 8 |
| Bellevue and Allied Hospitals | 36 | 2,460 | 245 | 24 | 2 | 53 |
| Bridges | 9 | 87 | 20 | .. | .. | .. |
| Charities | 106 | 6,975 | 113 | 5 | .. | 33 |
| College of The City of New York | 7 | 78 | .. | 509 | .. | 3 |
| Correction | 19 | 1,961 | 26 | 12 | .. | 5 |
| Education | 230 | 87,837 | 773 | 11 | 32 | 183 |
| Fire | 128 | 5,128 | 86 | 35 | .. | .. |
| Health | 20 | 1,537 | 19 | .. | 5 | 3 |
| Normal College | 2 | 617 | 12 | 34 | .. | 3 |
| Parks | 44 | 530 | 49 | 156 | .. | 2 |
| Police | 60 | 4,101 | 726 | .. | 28 | .. |
| Public Buildings and Offices | 66 | 7,139 | 1,182 | 8 | 2 | 8 |
| Sheriff's Office | 1 | 50 | 51 | .. | .. | .. |
| Street Cleaning | 63 | 1,402 | 3 | 23 | .. | .. |
| Tenement House | 1 | .. | .. | .. | .. | .. |
| Water Supply, Gas and Electricity | 26 | 673 | 46 | 14 | 23 | 4 |
| Total | 830 | 127,892 | 5,408 | 834 | 94 | 305 |

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C.

under the supervision of the Bureau of Lamps and Lighting During the Year 1908, on December 31, 1908:

| Sterilizers. | Hot Plates. | Water Heaters. | Pumps. | Engines. | Furnaces. | Sad Iron Heaters. | Ironing Machines. | Incubators. | Radiators. | Clothes Dryers. | Gas Logs. | Baking Machines. | Coffee Urns. | Broilers. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .. | 12 | 3 | 1 | .. | 5 | 2 | .. | .. | 20 | .. | 8 | .. | .. | .. |
| 5 | 36 | 2 | 1 | .. | .. | 9 | 5 | .. | 15 | .. | 1 | 9 | 2 | 4 |
| .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 6 | 138 | 2 | .. | 1 | 1 | 1 | 6 | 5 | 6 | .. | 1 | .. | .. | .. |
| .. | 20 | 1 | 2 | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 3 | 9 | .. | .. | .. | .. | 1 | .. | .. | 3 | .. | .. | .. | .. | .. |
| .. | 1,345 | 70 | 165 | 78 | .. | .. | .. | .. | 317 | .. | 4 | .. | .. | .. |
| .. | 42 | 3 | .. | 1 | 2 | .. | .. | .. | 8 | 15 | .. | .. | .. | .. |
| .. | 46 | 3 | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. |
| .. | 19 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| .. | 17 | 3 | .. | .. | 2 | .. | .. | .. | 6 | .. | .. | .. | .. | .. |
| .. | 29 | .. | 1 | .. | .. | .. | .. | .. | 32 | 1 | .. | .. | .. | .. |
| .. | 11 | 1 | 2 | 1 | 1 | .. | .. | .. | 8 | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| .. | 6 | 2 | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 1 | 12 | 1 | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. | .. | .. |
| 15 | 1,744 | 91 | 172 | 82 | 14 | 13 | 11 | 5 | 428 | 16 | 14 | 9 | 2 | 4 |

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## TABLE

The following table shows the number of buildings in Manhattan and The Bronx together with the total number of electric lights and appliances in service in those

| Name of Department. | Number of Buildings. | Arc Lamps. | 4-Candlepower Incandescent. | 8-Candlepowe. Incandescent. | 16-Candlepower Incandescent. | 20-Candlepower Incandescent. | 32-Candlepower Incandescent. | 40-Candlepower Incandescent. |
|---|---|---|---|---|---|---|---|---|
| Armories | 12 | 434 | 114 | 654 | 8,701 | 1 | 226 | .. |
| Bellevue and Allied Hospitals | 36 | .. | .. | .. | 4,988 | .. | 1 | .. |
| Bridges | 9 | 404 | .. | .. | 1,718 | 24 | 16 | .. |
| Charities | 106 | 15 | .. | 64 | 1,597 | 358 | 37 | .. |
| College of The City of New York | 7 | 79 | .. | 106 | 6,341 | .. | 270 | .. |
| Correction | 19 | 49 | .. | 1,124 | 3,376 | 18 | .. | .. |
| Education | 230 | 85 | .. | 3,949 | 107,506 | 11,348 | 15 | .. |
| Fire | 128 | 1 | .. | 338 | 3,207 | 338 | 23 | .. |
| Health | 20 | 1 | .. | 1 | 3,023 | 131 | .. | .. |
| Normal College | 2 | 3 | .. | .. | 351 | .. | 6 | .. |
| Parks | 44 | 26 | .. | .. | 780 | .. | 4 | .. |
| Police | 60 | .. | .. | 218 | 1,873 | 444 | 19 | 2 |
| Public Buildings and Offices | 66 | 73 | .. | 4,003 | 11,927 | 1,517 | 931 | .. |
| Sheriff's Office | 1 | .. | .. | .. | .. | .. | .. | .. |
| Street Cleaning | 63 | 7 | .. | .. | 321 | .. | 5 | .. |
| Tenement House | 1 | .. | .. | .. | .. | 461 | .. | 42 |
| Water Supply, Gas and Electricity | 26 | 2 | .. | .. | 8 | .. | .. | .. |
| Total | 830 | 1,179 | 114 | 10,457 | 155,717 | 14,640 | 1,553 | 44 |

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D.

under the supervision of the Bureau of Lamps and Lighting during the year 1908, buildings on December 31, 1908:

| 50-Candlepower Incandescent. | 75-Candlepower Incandescent. | 100-Candlepower Incandescent. | Cooper-Hewitt Lamps. | Electric Irons. | Stereopticons. | Motors. | Fans. | Searchlights. | Heaters. | Sad Iron Heaters. | Ironing Machines. | Sterilizers. | X-Ray Machines. | Incubators. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | .. | .. | .. | .. | .. | 21 | 18 | 1 | 1 | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | 32 | 21 | .. | 2 | 10 | 3 | 27 | 2 | 2 |
| 35 | .. | .. | .. | .. | .. | 13 | .. | .. | .. | .. | .. | .. | .. | .. |
| 15 | .. | .. | .. | .. | .. | 6 | 20 | .. | .. | 14 | .. | .. | .. | .. |
| 38 | .. | .. | .. | .. | .. | 129 | .. | .. | .. | .. | .. | .. | 2 | 3 |
| .. | .. | 1 | .. | .. | .. | 8 | 1 | .. | .. | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | 3 | 6 | 129 | 4 | .. | .. | .. | .. | .. | .. | .. |
| 1 | .. | .. | 4 | .. | .. | 13 | 10 | .. | .. | .. | .. | .. | .. | .. |
| .. | 9 | 8 | .. | 14 | .. | 35 | 76 | .. | 10 | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 8 | .. | 1 | .. | .. | .. | 2 | 15 | .. | 1 | .. | .. | .. | .. | .. |
| 23 | .. | 2 | .. | .. | .. | 8 | 41 | .. | 1 | .. | .. | .. | .. | .. |
| .. | .. | 4 | .. | .. | .. | 66 | 72 | .. | .. | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. | .. | .. | .. | .. | .. |
| 15 | 30 | 30 | .. | .. | .. | .. | 10 | .. | .. | .. | .. | .. | .. | .. |
| .. | .. | .. | 16 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 144 | 39 | 46 | 20 | 17 | 6 | 469 | 288 | 1 | 15 | 24 | 3 | 27 | 4 | 5 |

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TABLE

The following table is a comparative statement of the number of 50-watt electric 1908, in the public buildings under the supervision of the Bureau of Lamps and increase or decrease in 1908:

| Name of Department. | Number of Buildings. | |
|---|---|---|
| | 1907. | 1908. |
| Armories | 12 | 12 |
| Bellevue and Allied Hospitals | 36 | 36 |
| Bridges | 8 | 9 |
| Charities | 103 | 106 |
| College of The City of New York | 2 | 7 |
| Correction | 19 | 19 |
| Education | 233 | 230 |
| Fire | 122 | 128 |
| Health | 18 | 20 |
| Normal College | 2 | 2 |
| Parks | 43 | 44 |
| Police | 59 | 60 |
| Public Buildings and Offices | 68 | 66 |
| Sheriff's Office | 1 | 1 |
| Street Cleaning | 62 | 63 |
| Tenement House | 1 | 1 |
| Water Supply, Gas and Electricity | 24 | 26 |
| Total | 813 | 830 |

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E.

and 5-foot open flame burner gas equivalents in service during the years 1907 and
Lighting, Boroughs of Manhattan and The Bronx, together with the per cent. of

| 50-Watt Equivalents. | | Per Cent of Increase or Decrease. | Five-Foot Open Flame Burner Equivalents. | | Per Cent. of Increase or Decrease. |
|---|---|---|---|---|---|
| 1907. | 1908. | | 1907. | 1908. | |
| 14,385 | 13,869 | —3.6 | 9,487 | 9,382 | —1.1 |
| 5,015 | 4,990 | —0.5 | 2,643 | 2,713 | +2.6 |
| 2,602 | 5,894 | +126.5 | 89 | 97 | +9.0 |
| 3,055 | 2,246 | —26.5 | 7,492 | 7,088 | —5.4 |
| 317 | 7,809 | +2,363.4 | 380 | 78 | —79.5 |
| 3,723 | 4,460 | +19.8 | 2,604 | 1,987 | —23.7 |
| 113,023 | 121,708 | +7.7 | 83,736 | 88,738 | +6.0 |
| 3,156 | 3,770 | +19.5 | 4,910 | 5,214 | +6.2 |
| 3,856 | 3,216 | —16.6 | 1,783 | 1,576 | —11.6 |
| 357 | 393 | +10.1 | 629 | 629 | ..... |
| 2,876 | 1,071 | —62.8 | 524 | 579 | +10.5 |
| 1,799 | 2,480 | +37.9 | 4,891 | 4,939 | +1.0 |
| 17,393 | 18,037 | +3.7 | 6,715 | 8,329 | +24.0 |
| ..... | ..... | ..... | 101 | 101 | ..... |
| 396 | 401 | +1.3 | 1,392 | 1,405 | +1.0 |
| 578 | 705 | +22.0 | ..... | ..... | ..... |
| 94 | 28 | —70.2 | 852 | 811 | —4.8 |
| 172,625 | 191,077 | | 128,228 | 133,666 | |

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## TABLE F.

Table showing number of gas regulators in commission under contract with Gas Consumers' Association in the Boroughs of Manhattan and The Bronx for year 1908, and memorandum of work done and merchandise furnished by them:

### ANNUAL REPORT, 1908, FROM GAS CONSUMERS' ASSOCIATION OF THE UNITED STATES.

Gas regulators on rental and maintained in public buildings and service given in connection with gas pipes and burners, together with memorandum of work done under contract for the Boroughs of Manhattan and The Bronx:

Rental Account.

| | | |
|---|---|---|
| January 1, 1908, machines on rental | | 583 |
| Attached during the year | 33 | |
| Removed during the year | 25 | |
| | | 8 |
| On rental December 31, 1908 | | 591 |
| Inspections made | | 7,075 |
| Defects found and remedied | | 342 |
| Complaints from Department attended to | | 257 |
| Cases requiring pumping or cutting out of stoppages | | 108 |
| Regulators changed | | 51 |
| New burners put on | | 7,063 |
| Record pressure gauge tests made | | 13 |
| Special inspection of schools after vacation, before opening | | 261 |
| Gas passed by regulators, cubic feet | | 188,070,700 |
| Average saving effected, 18 per cent., cubic feet | | 41,283,800 |
| Value of gas saved, at 75 cents per thousand feet | | $30,962 85 |
| Rental cost of regulators and service | | 7,651 24 |
| Net saving | | $23,311 61 |

Maintenance Account.

| | |
|---|---|
| January 1, 1908, gas regulators owned by the City maintained by the company, and service given in connection therewith | 22 |
| Discontinued | 3 |
| In commission December 31, 1908 | 19 |

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| | |
|---|---|
| Inspections made | 243 |
| Defects found and remedied | 15 |
| Complaints from Department attended to | 11 |
| Cases requiring pumping or cutting out of stoppages | 2 |
| New burners put on | 51 |
| Record pressure gauge tests made | 7 |
| Gas passed by the governors, cubic feet | 18,490,800 |
| Cost of maintenance | $272 75 |

## TABLE G.

The following table shows the number of meters, gas and electric, set, exchanged and removed, under the supervision of the Inspectors from the Bureau of Lamps and Lighting, in the Public Buildings of Manhattan and The Bronx, during the year 1908:

| | Gas. | | | Electric. | | |
|---|---|---|---|---|---|---|
| | New Sets. | Removals. | Exchanges. | New Sets. | Removals. | Exchanges. |
| January | 7 | 5 | 18 | 6 | 6 | 10 |
| February | 11 | 4 | 15 | 7 | .. | 2 |
| March | 8 | 1 | 20 | 6 | .. | .. |
| April | 9 | 1 | 51 | 1 | .. | .. |
| May | 6 | 1 | 14 | 5 | .. | .. |
| June | 4 | 5 | 24 | 13 | 1 | 2 |
| July | 6 | 1 | 103 | 5 | .. | 2 |
| August | 14 | 1 | 21 | .. | .. | .. |
| September | 9 | .. | 18 | 4 | .. | 7 |
| October | 14 | 6 | 6 | 7 | 3 | 1 |
| November | 5 | 4 | 11 | 6 | 3 | .. |
| December | 5 | 4 | 13 | 10 | .. | 2 |
| Total | 98 | 33 | 314 | 70 | 13 | 26 |

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## TABLE H.

The following table shows the number of inspections of the public buildings in Manhattan and The Bronx made by the Inspectors from the Bureau of Lamps and Lighting, during the year 1908:

| Month. | Day. | Night. | Total. |
|---|---|---|---|
| January | 416 | 96 | 512 |
| February | 289 | 79 | 368 |
| March | 268 | 90 | 358 |
| April | 270 | 86 | 356 |
| May | 274 | 76 | 350 |
| June | 251 | 63 | 314 |
| July | 269 | 80 | 349 |
| August | 240 | 68 | 308 |
| September | 233 | 74 | 307 |
| October | 294 | 80 | 374 |
| November | 285 | 70 | 355 |
| December | 414 | 120 | 534 |
| Total | 3,503 | 982 | 4,485 |

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## REPORT OF DIVISION OF PUBLIC BUILDINGS, BOROUGH OF BROOKLYN.

Brooklyn, May 6, 1909.

Mr. CHARLES F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—Under this branch of the work of the Bureau of Lamps and Lighting (the care of lighting in public buildings) there were on December 31, 1908, 483 buildings lighted by either gas or electricity, and 53 buildings in course of construction, which will bring the total to 536 buildings during 1909. This includes the various administration and department buildings in this Borough, with the exception of the Department of Docks and Ferries and the Public Libraries.

On December 31, 1908, there were 182 gas regulators in use in the various buildings, in connection with the gas lighting, and during the present year we will probably add thirty more to this number. We are continuing the work of separating the heating and power apparatus from the lighting lines, and having gas used for heating and power billed accordingly.

During the past year, the actual lighting loads in practically all public buildings in this Borough, which are connected with the Edison service, were equipped with 50-watt Gem lamps. The company has gone further and discontinued the use of the carbon lamp 3.1 watt entirely, and they are now equipping new installations throughout with the new type of Gem metallized filament lamp. They are also preparing to furnish two new types of lamps known as 40-watt 16 candle power, and 80-watt 32 candle power lamps. These lamps I believe will be very useful in equalizing the lighting load in a building.

In some other instances, where 8 candle power lamps are now installed, it would be advantageous to substitute a 40-watt lamp which will give 100 per cent increase in illumination, with an increase of 20 per cent. in consumption. In still other cases, where the 50-watt lamps give more than sufficient illumination, the 40-watt lamps can be substituted, and the same ratio of efficiency maintained.

The public buildings connected to and supplied by the Flatbush Gas Company are still equipped with old type carbon lamps, but this matter is now being taken up with a view to having the Flatbush Company furnish similar lamps to those supplied by the Edison Company.

Please find herewith statements showing the buildings in which installations were discontinued, orders issued for new lighting and other matters incident thereto, list of the public schools in which current was disconnected prior to summer vacation and dates when same were again put in commission, another showing present installations for each Department on December 31, 1908, with proposed increases for following year, and statement of the cost for lighting during the years 1907 and 1908, showing relative saving on increased installation.

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I also submit report in detail as to changes in lighting and power installations and corrections suggested in conditions existing in public buildings in this Borough.

Referring to the matter of checking up the installations in the various buildings in this Borough, which I consider very essential, as the figures compiled before this Bureau was established have been found in many instances incorrect, I have been unable to make any progress in this work owing to the fact that such a small force of Inspectors is available. I would request that two additional Inspectors be assigned to this Bureau, and as the largest part of the work has to do with electric lighting, would respectfully suggest that, when secured, the Inspectors should have some general knowledge of electric installation. This Bureau is also in need of a Clerk to tabulate records and do general office work.

In order that this Bureau may make its own tests on all new installations before accepting same and not be dependent on instruments furnished by the contractors who are doing the work, I would also request that this Bureau be equipped with the following portable instruments: 1 alternating current voltmeter, 1 direct current voltmeter, 1 direct current ammeter and 1 alternating current ammeter.

Respectfully submitted,

A. J. MORAN. General Inspector.

Statement showing installations equivalent of 50-watt electric lamps in buildings of the following Departments on December 31, 1908; the increased installation contemplated and provided for up to December 31, 1909; the total installation and the increase per cent.:

| Department. | Installation December 31, 1908. | Proposed Increase During 1909. | Total Installation. | Increase, Per Cent. |
|---|---|---|---|---|
| Armories | 26,481 | 2,128 | 28,609 | 8 |
| Bridges | 908 | ..... | 908 | .. |
| Charities | 5,566 | 3,849 | 9,415 | 69 |
| Corrections | 544 | 1,627 | 2,171 | 400 |
| Education | 135,000 | 42,743 | 177,743 | 32 |
| Fire | 3,110 | 826 | 3,936 | 26 |
| Health | 2,542 | 2,186 | 4,728 | 86 |
| Parks | 5,504 | 707 | 6,211 | 13 |
| Police | 4,165 | 594 | 4,759 | 14 |
| Public Buildings and Offices | 10,965 | 1,200 | 12,165 | 11 |
| Street Cleaning | 1,280 | 199 | 1,479 | 15 |
| Water Supply, Gas and Electricity | 2,482 | 1,427 | 3,908 | 58 |
| Total | 198,547 | 57,486 | 256,033 | 29 |

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Statement showing increased installations in the buildings in the various Departments, during the past year:

Equivalent of 50-watt Lamps.

| | 1907. | 1908. | Increase. | Per Cent. |
|---|---|---|---|---|
| Armories | 25,279 | 26,481 | 1,202 | 4.7 |
| Bridges | 888 | 908 | 20 | 2.2 |
| Charities | 5,527 | 5,566 | 39 | .7 |
| Corrections | 371 | 544 | 173 | 46.6 |
| Education | 128,209 | 135,000 | 6,791 | 5.3 |
| Fire | 2,901 | 31,110 | 209 | 7.3 |
| Health | 1,871 | 2,542 | 671 | 35.0 |
| Parks | 5,385 | 5,504 | 119 | 2.2 |
| Police | 4,220 | 4,165 | —55 | —1.3 |
| Public Buildings and Offices | 10,753 | 10,965 | 212 | 1.9 |
| Street Cleaning | 639 | 1,280 | 641 | 100.0 |
| Water Supply, Gas and Electricity | 2,196 | 2,482 | 286 | 13.0 |
| Total | 188,239 | 198,547 | 10,308 | 5.4 |

Statement showing increased cost for lighting in the buildings of the various Departments, during the past year as taken from bills of the several companies supplying gas and current:

| | 1907. | 1908. | Increase. | Per Cent. |
|---|---|---|---|---|
| Kings County Lighting Company | $4,388 70 | $3,715 50 | —$673 20 | —15.0 |
| Flatbush Gas Company | 12,991 54 | 12,425 96 | —565 58 | —4.3 |
| Brooklyn Union Gas Company | 53,624 71 | 52,105 04 | —1,519 67 | —2.8 |
| Edison Electric Illuminating Company | 86,149 79 | 89,946 42 | 3,796 63 | 4.4 |
| Brooklyn Borough Gas Company | 2,009 68 | 1,472 13 | —537 55 | —26.7 |
| Total | $159,164 42 | $159,665 05 | $500 63 | 0.3 |

You will note that the percentage of increase in installations is much less than was contemplated for 1908, as stated in last year's report; this is due to the fact that the appropriations during the past year have not been sufficiently large to permit the undertaking of many proposed improvements.

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Statement showing public buildings in which installations were discontinued during the period from January 1, 1908, to December 31, 1908:

| Designation. | Equivalent of 50-Watt Electric Lamps. | |
|---|---|---|
| | January 1, 1908. | Discontinued. |
| **Department of Education.** | | |
| Temporary offices, No. 122 Livingston street | 104 | April 15, 1908 |
| Public School 5 (old), Duffield and Johnson streets | 613 | Sept. 22, 1908 |
| Public School 30 (old), Wolcott, near Van Brunt street | 541 | Aug. 5, 1908 |
| Public School 69, Ryerson street, near Myrtle avenue | 2 H. P. | Dec. 22, 1908 |
| **Department of Fire.** | | |
| Engine Company 112, No. 136 Wythe avenue | 15 | July 4, 1908 |
| Engine Company 117, No. 940 DeKalb avenue | 11 | July 4, 1908 |
| Hook and Ladder Company 56, No. 124 Greenpoint avenue | 15 | July 7, 1908 |

Statement of Public School Buildings in Which Current was Discontinued Before Summer Vacation and Dates When Reconnections Were Made.

| | Order to Disconnect Light and Power. | Order to Reconnect. | |
|---|---|---|---|
| | | Light. | Power. |
| Public School 2 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 3 | June 23, 1908 | Sept. 23 | Sept. 23 |
| Public School 5 | June 23, 1908 | *..... | *..... |
| Public School 6 | June 23, 1908 | Sept. 14 | July 21 |
| Public School 7 | June 23, 1908 | Aug. 13 | July 10 |
| Public School 11 | June 23, 1908 | Sept. 30 | Sept. 13 |
| Public School 15 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 17 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 18 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 19 | June 23, 1908 | Oct. 14 | Sept. 17 |
| Public School 20 | June 23, 1908 | Oct. 21 | Oct. 21 |
| Public School 21 | June 23, 1908 | Sept. 18 | Sept. 18 |
| Public School 22 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 26 | June 23, 1908 | Sept. 14 | Sept. 14 |

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| | Order to Disconnect Light and Power. | Order to Reconnect. Light. | Power. |
|---|---|---|---|
| Public School 27 | June 23, 1908 | *..... | Sept. 17 |
| Public School 30 | June 23, 1908 | Sept. 14 | ..... |
| Public School 33 | June 23, 1908 | Dec. 10 | Dec. 10 |
| Public School 40 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 42 | June 23, 1908 | Sept. 15 | July 7 |
| Public School 44 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 45 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 50 | June 23, 1908 | Nov. 10 | ..... |
| Public School 63 | June 23, 1908 | Nov. 13 | ..... |
| Public School 64 | June 23, 1908 | *..... | Sept. 17 |
| Public School 69 | June 23, 1908 | ..... | Sept. 17 |
| Public School 78 | June 23, 1908 | ..... | July 21 |
| Public School 80 | June 23, 1908 | Oct. 28 | Sept. 17 |
| Public School 83 | June 23, 1908 | Nov. 16 | Nov. 16 |
| Public School 84 | June 23, 1908 | Nov. 6 | ..... |
| Public School 85 | June 23, 1908 | Nov. 11 | Sept. 17 |
| Public School 89 | June 23, 1908 | Dec. 22 | ..... |
| Public School 92 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 102 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 103 | June 23, 1908 | Dec. 24 | Sept. 17 |
| Public School 105 | June 23, 1908 | *..... | ..... |
| Public School 106 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 110 | June 23, 1908 | Nov. 13 | ..... |
| Public School 117 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 118 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 119 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 123 | June 23, 1908 | Sept. 16 | Sept. 16 |
| Public School 124 | June 23, 1908 | Nov. 17 | Sept. 17 |
| Public School 125 | June 23, 1908 | Aug. 28 | Aug. 28 |
| Public School 127 | June 23, 1908 | Aug. 22 | Aug. 22 |
| Public School 128 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 129 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 130 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 131 | June 23, 1908 | Aug. 28 | Aug. 28 |
| Public School 132 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 133 | June 23, 1908 | *..... | Oct. 14 |
| Public School 134 | June 23, 1908 | Sept. 15 | Sept. 15 |

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| | Order to Disconnect Light and Power. | Order to Reconnect. Light. | Power. |
|---|---|---|---|
| Public School 136 | June 23, 1908 | Sept. 17 | Sept. 17 |
| Public School 137 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Public School 138 (Teachers' Training School) | June 23, 1908 | Aug. 18 | July 10 |
| Public School 139 | June 23, 1908 | Dec. 22 | Sept. 17 |
| Public School 140 | June 23, 1908 | ..... | Sept. 17 |
| Public School 141 | June 23, 1908 | Oct. 2 | Oct. 2 |
| Public School 142 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 143 | June 23, 1908 | Sept. 14 | July 7 |
| Public School 144 | June 23, 1908 | Oct. 30 | Sept. 17 |
| Public School 145 | June 23, 1908 | Nov. 4 | Sept. 17 |
| Public School 146 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 147 | June 23, 1908 | Sept. 14 | Sept. 14 |
| Public School 148 | June 23, 1908 | Sept. 2 | Sept. 2 |
| Public School 151 | June 23, 1908 | Oct. 23 | Sept. 17 |
| Public School 152 | June 23, 1908 | Sept. 15 | Sept. 15 |
| Boys' High School | June 23, 1908 | Sept. 11 | Sept. 11 |
| Girls' High School | June 23, 1908 | Sept. 11 | Sept. 11 |
| Commercial High School | June 23, 1908 | July 27 | July 27 |
| Erasmus Hall High School (main) | June 23, 1908 | Sept. 11 | Sept. 11 |
| Erasmus Hall High School (frame) | June 23, 1908 | Nov. 27 | Nov. 27 |
| Erasmus Hall High School (cottages) | April 1, 1908 | Nov. 2 | ..... |
| Public School 13 | June 23, 1908 | Sept. 15 | Sept. 15 |

* Current has not been ordered reconnected.

## Armories.

On December 31, 1908, there were eight (8) buildings in this Borough under the jurisdiction of the Board of Armory Commissioners.

The installation equivalent of 50-watt electric lamps was 26,481, and the increased installation contemplated up to December 31, 1909, is 2,128, making a total of 28,609, an increase of 8 per cent.

The following are the locations of buildings where the additional lighting is contemplated:

Thirteenth Coast Artillery, Sumner and Jefferson Avenues—Plans and specifications were prepared for the completion of the lighting of the administration building with electricity on September 23, 1908, after the contract had been awarded. When these plans were submitted they were practically abandoned and a new system of

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lighting laid out by this Bureau, care being given to equipping all fixtures in corridors, squad hall, lecture hall and council room with suitable prismatic reflecting glass shades. On March 1, 1909, the following installation was put in commission: 1,000 50-watt lamps.

Chief of Staff's Headquarters—This additional installation will be put in commission about June 1, 1909, and will be 28 60-watt lamps, 8 40-watt lamps, 8 ½-ampere plugs and 4 gas burners.

Fourteenth Regiment Armory, Eighth Avenue and Fourteenth Street—Plans and specifications for the equipment of the administration building throughout with electricity were filed with this Bureau on June 26, 1908. These plans were practically prepared by this Bureau and care was given to equip all fixtures in corridors, squad hall, lecture hall and bowling alleys with proper reflectors. This work will be completed about July 1, 1909, and the additional installation will be 757 50-watt lamps and one 1-horsepower electric motor.

Twenty-third Regiment Armory, Bedford and Atlantic Avenues, Second Brigade Headquarters—Plans and specifications for equipping these quarters with electricity were filed with this Bureau on April 7, 1908; the lighting was laid out by this Bureau and care was given to equip the fixtures in the officers' rooms with suitable glassware. The old fixtures in the main room were retained temporarily. A contract has since been awarded for new fixtures for this room equipped with proper reflectors and tungsten lamps. The additional installation will be completed March 1, 1909, and will be 26.50-watt lamps, 12 ½-ampere outlets, 8 60-watt lamps and 8 40-watt lamps.

Squadron C Armory, President Street and Bedford Avenue, Rifle Range—Additional lighting will be ready about May 1, 1909: 6 50-watt lamps and 8 gas burners.

Forty-seventh Regiment, Marcy Avenue and Heyward Street—Plans and specifications for the equipping of the administration building throughout with electricity were filed with this Bureau June 25, 1908. These plans were practically prepared by this Bureau and care was given to equip all fixtures with proper reflectors. This work was completed and the lighting placed in commission on December 24, 1908, and has given entire satisfaction. There will also be installed and ready for current about July 1 one 1 horsepower electric motor.

Second Company Signal Corps, Dean Street, East of Washington Avenue—Plans and specifications for the equipping of the administration building throughout with electricity were filed with this Bureau on June 15, 1908. These plans were practically prepared by this Bureau and care was given to equip all fixtures with suitable glass shades. This work is now nearing completion and will be put in commission by July 1. The installation will be 208 50-watt lamps, 15 ½-ampere outlets and one 1-horsepower electric motor.

Third Battery Field Artillery, Claremont, near Myrtle Avenues—In this building will be installed and ready for current about July 1 one 1-horsepower electric motor.

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The lighting of the drill sheds in the various armories in this Borough has been carefully investigated during the past year and data has been compiled showing that by the use of tungsten lamps arranged in coronas, the lighting can be increased about 100 per cent., with a saving to this Department of 35 per cent., including the cost of renewal of the tungsten lamps. The drill sheds are used on an average of 300 hours per year, and to date, without exception, the drill sheds that are lighted by arcs are not giving satisfaction.

In lighting the tan bark rings of Squadron C and the Third Battery Field Artillery armories, better results could be secured by using flaming arc instead of tungsten lamps, as the latter lamps would not stand the cleaning to which they would be subjected when installed in a tan bark ring.

In regard to the lighting of the drill shed in the armory of the Second Battalion Naval Militia, situated at First avenue and Fifty-second street, nothing has been done to remedy existing conditions. This Bureau made a number of tests in relation to the above and made a detailed report to you in March, 1908. This report included a proposed system of lighting designed by this Bureau which would not necessitate any change in wiring and would give increased lighting with a lower cost to this Department. The plan of lighting submitted was similar to that proposed for lighting the other drill sheds in armories in this Borough.

Department of Bridges.

On December 31, 1908, there were in this Borough under the jurisdiction of the Department of Bridges thirteen buildings lighted, with an installation equivalent of 908 50-watt lamps.

Department of Charities.

On December 31, 1908, there were 37 buildings in this Borough, under the jurisdiction of the Department of Charities lighted and 9 buildings in course of construction which will be ready for lighting during the year 1909.

The installation equivalent of 50-watt electric lamps was 5,566 and the increased installation contemplated up to December 31, 1909, is 3,849, making a total of 9,415, an increase of 69 per cent.

The following are the locations of buildings in which additional lighting is contemplated:

Coney Island Hospital, Ocean Parkway, Between Avenues X and Z—There are six of these buildings, which will probably be ready for lighting July 1, 1909, and the installation will be:

Nurses' Building—117 50-watt lamps, 97 gas burners.

Helpers' Building—77 50-watt lamps, 65 gas burners.

Stable Building—47 50-watt lamps, 30 gas burners.

Morgue Building—56 50-watt lamps, 42 gas burners.

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Main Building—650 50-watt lamps, 25-horsepower motors, 557 gas burners.

Power House—62 50-watt lamps, 47 gas burners, 5-horsepower motors.

Kings County Hospital, Clarkson Street, Near Albany Avenue, Annex Building—The Department of Charities have not decided whether the present building shall be remodeled or new building erected. The installation proposd is 878 50-watt lamps, 397 gas burners.

Pathological Building—Plans were filed with this Bureau on October 6, 1908, for this new building on grounds of the Kings County Hospital and the installation which will be ready about December 1, 1909, will be 197 50-watt lamps, 30 gas burners.

Nurses' Home—This building will probably be ready for lighting about December 1, 1909, and the installation will be 350 50-watt lamps, 150 gas burners, 15-horsepower motors.

Department of Correction.

On December 31, 1908, there was one building in this Borough under the jurisdiction of the Department of Correction.

The installation equivalent of 50-watt electric lamps was 544 and the increased installation contemplated up to December 31, 1909, is 1,627, making a total of 2,171, an increase of 400 per cent.

City Prison, Raymond and Willoughby Streets—Extensive alterations are being made under two contracts calling for the erection of new female prison and administration building and male prison.

Revised plans were submitted on October 15, 1908, for lighting the female building and administration building and approved so far as related to the number, arrangement and kind of lighting and power appliances. the installation which will be completed about November 1, 1909, being 750 50-watt lamps, 150 gas burners, 48-horsepower motors, 20 amperes for heating.

On June 22, 1908, plans and specifications for equipment of the male prison were submitted to us, after the contract for work had been awarded, the proposed installation being 1,011 50-watt lamps, 260 gas burners, 17¾-horsepower in motors.

The plans for equipment of the female prison included the installation of an isolated plant of sufficient capacity to furnish current to the male prison as well. This plant was not approved by this Department but the work of installing same is under way, having been made part of the contract. Several changes were made in the lighting specifications for these buildings, at the request of this Bureau, particular care being given to the equipment of fixtures as far as possible, with prismatic reflecting glass shades of suitable type.

Department of Education.

On December 31, 1908, there were 171 school buildings in this Borough, under the jurisdicition of the Department of Education, lighted, 9 buildings in course of

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construction and 2 buildings which have not been lighted, but which will be ready for lighting during the year of 1909.

The installation equivalent of 50-watt lamps was 135,000 and the increased installation contemplated up to December 31, 1909, is 42,743, making a total of 177,743, an increase of 32 per cent.

The following are the locations of buildings where the additional lighting is contemplated:

Girls' High School, Nostrand Avenue and Halsey Street—Additional installation which will be ready for lighting about September 1, 1909, will be 2,000 50-watt lamps.

Teachers' Training School, Park Place, West of Nostrand Avenue—Additional installation which will be ready about June 1, 1909, will be 11 2-burner gas stoves, 1 4-burner gas range, 6-horsepower gas engine.

Erasmus Hall High School, Flatbush Avenue, Near Church Avenue—Additional installation for which application was received March 30, 1909, will be ready about June 1, 1909, and will be 5-horsepower electric motor.

Boys' High School, Marcy and Putnam Avenues—Additional lighting for which application was filed December 11, 1908, will be ready about March 1, 1909, and will be 12 50-watt lamps.

Manual Training High School, Seventh Avenue and Fourth Street—Additional installation for which application was filed March 18, 1908, will be ready about April 1, 1909, and will be 1 3-horsepower electric motor.

Public School 3, Hancock Street, Near Bedford Avenue—Additional installation for which application was filed December 9, 1908, will be ready about April 1, 1909, 7½-horsepower electric motor.

Public School 6, Baltic Street, Near Smith Street—Additional installation for which application was filed March 11, 1909, will be ready about May 1, 1909, and will be 2 187-watt lamps.

Public School 9, Vanderbilt Avenue and Sterling Place—Additional installation for which application was filed March 5, 1909, will be ready about April 1, 1909, and will be 10 2-burner gas stoves, 4 1-burner gas stoves, 2 gas ranges, 1 water heater.

Public School 16, Wilson Street, Near Bedford Avenue—Application filed January 11, 1909, and the additional installation which will be ready about September 1, 1909, will be 35 125-watt lamps, 6 50-watt lamps.

Public School 24, Beaver and Belvidere Streets—Gas plans filed March 6, 1908, electric plans August 21, 1908, for additional installation which will be ready about February 15, 1909: 360 gas burners, 2 2-burner gas stoves, 1 25-horsepower gas engine, 124 187-watt lamps, 415 50-watt lamps, 230 8-candle power lamps, 5 horsepower in motors.

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Public School 29, Columbia and Amity Streets—Application filed March 25, 1909, for additional installation which will be ready about September 1, 1909: 48 125-watt lamps, 8 50-watt lamps.

Public School 31, Dupont Street, Near Manhattan Avenue—Application filed February 20, 1909, for additional installation which will be ready about May 1, 1909: 192 gas burners.

Public School 32, Hoyt and President Streets—Application filed February 20, 1909, for additional installation, which will be ready about May 1, 1909; 30 125-watt lamps.

Public School 54, Walworth Street, Near Myrtle Avenue—Electric plans filed August 5, 1908, for additional lighting, which will be ready about May 1, 1909: 84 50-watt lamps, 12 125-watt lamps, 86 187-watt lamps.

Public School 63, Hinsdale Street, Near Glenmore Avenue—Application filed November 6, 1908, for additional installation, which will be ready about March 1, 1909; 6 50-watt lamps.

Public School 64, Berriman Street and Belmont Avenue—Application filed February 20, 1908, for additional lighting, which will be ready for service about September 1, 1909: 1,654 50-watt lamps, 25½ horsepower in motors, 861 gas burners, 20 2-burner gas stoves; 2 gas ranges.

Public School 66, Osborn Street, Near Sutter Avenue—Electric plans filed July 18, 1906, for additional installation which will be ready about February 1, 1909: 1,300 50-watt lamps, 652 8-candle power lamps, 10-horsepower electric motor.

Public School 77, Second Street, Near Sixth Avenue—Application filed February 20, 1909, for additional installation, which will be ready about April 1, 1909: 226 gas burners.

Public School 80, West Seventeenth Street, Near Neptune Avenue—Gas plans filed April 22, 1908, for additional installation, which will be ready about June 1, 1909: 108 gas burners.

Public School 82, Fourth Avenue and Thirty-sixth Street—Application filed February 23, 1909, for additional installation, which will be ready about September 1, 1909: 184 gas burners.

Public School 75, Evergreen Avenue and Ralph Street—Gas plans filed April 24, 1908, electric plans August 7, 1908, for additional installation, which will be ready about February 18, 1909: 741 50-watt lamps, 307 8-candle power lamps, 20-horsepower motors, 515 gas burners, 4 2-burner gas stoves.

Public School 84, Glenmore and Stone Avenues—Gas plans filed January 20, 1909, electric plans March 30, 1909, for additional installation, which will be ready about November 1, 1909; 144 125-watt lamps, 1,338 50-watt lamps, 80 8-candle power lamps, 5-horsepower motors, 348 gas burners, 16 2-burner gas stoves, 2 1-burner gas stoves, 2 4-burner gas ranges.

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Public School 91, East New York Avenue and Maple Street—Electric plans filed June 9, 1908, for additional installation, which will be ready about September 1, 1909: 393 50-watt lamps.

Public School 93, New York Avenue and Herkimer Street, New Building—Gas plans filed February 20, 1908, electric plans May 22, 1908, for new installation, which will be ready about April 1, 1909: 664 50-watt lamps, 346 8-candle power lamps, 3½-horsepower motors, 642 gas burners, 24 1-burner gas stoves, 4 2-burner gas stoves, 2 4-burner ranges.

Public School 94, Sixth Avenue and Fiftieth Street—Electric plans filed June 19, 1908, for additional installation, which will be ready about February 1, 1909: 5½-horsepower electric motor.

Public School 97, Benson and Twenty-fifth Avenues—Electric plans were filed October 22, 1908, for additional installation, which will be ready about May 1, 1909: 30 125-watt lamps, 22 50-watt lamps.

Public School 101, Eighty-sixth Street, Near Eighteenth Avenue—Application filed February 20, 1909, for additional installation, which will be ready about May 1, 1909: 34 125-watt lamps, 18 50-watt lamps.

Public School 104, Ninety-second Street and Fifth Avenue—Electric plans filed November 12, 1907, for additional installation, which will be ready about March 1, 1909: 481 50-watt lamps, 146 8-candle power lamps, 21½-horsepower motors.

Public School 114, Remsen Avenue, Near Avenue F, Canarsie—Gas plans filed in October, 1907, for installation, which will be ready for lighting about November 1, 1909: 518 gas burners, 3 2-burner gas stoves, 24 1-burner gas stoves, 4 radiators, 2 4-burner gas ranges.

Public School 112, Fifteenth Avenue and Seventy-first Street—Electric plans filed February 18, 1907, for additional installation, which will be ready about September 1, 1909: 573 50-watt lamps, 379 8-candle power lamps. 2-horsepower motor.

Public School 126, Meserole Avenue and Lorimer Street—Gas plans filed January 20, 1909, electric plans filed March 4, 1909, for additional installation, which will be ready about September 1, 1909: 421 50-watt lamps, 4-horsepower electric motors, 302 gas burners, 15 2-burner gas stoves, 3 1-burner gas stoves, 2 4-burner gas ranges.

Public School 128, Twenty-first Avenue and Eighty-third Street—Gas plans filed January 20, 1909, electric plans filed March 4, 1909, for additional installation, which will be ready about September 1, 1909: 506 50-watt lamps, 4-horsepower electric motors, 359 gas burners, 14 2-burner gas stoves, 3 1-burner gas stoves, 2 4-burner gas ranges.

Public School 131, Fort Hamilton Avenue and Forty-third Street—Temporary annex. Gas plans filed January 22, 1909, for installation, which will be ready about April 1, 1909: 69 gas burners.

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Public School 135, Church Avenue and East Forty-eighth Street—This is a building not previously lighted. Application filed January 20, 1909, for installation, which will be ready about April 1, 1909; 86 gas burners, 1 2-burner gas stove.

Public School 140, Sixtieth Street, West of Fourth Avenue—Electric plans filed June 9, 1908, for additional installation which will be ready about April 1, 1909: 340 50-watt lamps, 57 8-candle-power lamps.

Public School 145, Central Avenue and Noll Street—Application filed February 20, 1909, for additional installation which will be ready about March 1, 1909: 2-horse-power motor.

Public School 149, Sutter Avenue and Vermont Street—Gas and electric plans filed February 10, 1907, for installation which will be ready about March 1, 1909: 1,092 gas burners, 25 1 burner gas stoves, 2 gas ranges, 1 3-horse-power gas engine, 1,548 50-watt lamps, 383 8-candle-power lamps, 12½-horse-power in motors.

Public School 152, Avenue G and East Twenty-third Street—Electric plans filed June 24, 1907, for additional installation, which will be ready February 1, 1909: 26½-horse-power electric motors.

Public School 153, Avenue T and East Twelfth Street, New Building—Electric plans filed December 11, 1908; gas plans filed January 9, 1909, for installation, which will be ready about September 1, 1909: 708 50-watt lamps, 291 8-candle-power lamps, 2½-horse-power electric motors, 594 gas burners, 4 2-burner gas stoves, 21 1-burner gas stoves.

Public School 154, Eleventh Avenue and Windsor Place—Electric plans filed August 7, 1908; gas plans filed January 14, 1909, for additional installation, which will be ready about April 1, 1909: 649 50-watt lamps, 185 8-candle-power lamps, 2½-horse-power motors, 4 2-burner gas stoves.

Public School 155, Eastern Parkway and Herkimer Street—Gas plans filed February 20, 1908, for additional installation, which will be ready about May 1, 1909: 826 gas burners, 2-horse-power gas engine.

Public School 156, Sutter Avenue and Barrett Street—Gas plans filed February 20, 1908; electric plans filed August 7, 1908, for new installation, which will be ready about June 1, 1909: 2,278 50-watt lamps, 7½-horse-power motors, 1,175 gas burners, 21 1-burner gas stoves, 4 2-burner gas stoves, 2 4-burner gas ranges.

Public School 157, Kent Avenue and Taaffe Place—Gas plans filed February 20, 1908; electric plans, December 16, 1908, for new installation, which will be ready about September 1, 1909: 2,000 50-watt lamps, 10-horse-power electric motor, 1,086 gas burners, 14 2-burner gas stoves, 2 gas ranges.

Public School 158, Belmont Avenue and Ashford Street—Electric plans filed August 7, 1908; gas plans filed February 20, 1908, for new installation, which will be ready about June 1, 1909: 1,439 50-watt lamps, 5½-horse-power electric motor, 838 gas burners, 15 2-burner gas stoves, 2 4-burner gas ranges.

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Public School 159, Pitkin Avenue and Hemlock Street—Electric plans filed August 7, 1908, for additional installation, which will be ready about May 1, 1909: 860 50-watt lamps, 175 8-candle-power lamps, 3½-horse-power electric motor.

Public School 160, Fort Hamilton Avenue and Fifty-first Street—Gas plans filed January 12, 1909; electric plans filed March 4, 1909, for new installation, which will be ready about September 1, 1909: 1,045 50-watt lamps, 3½-horse-power electric motor, 610 gas burners, 15 2-burner gas stoves, 3 1-burner gas stoves, 2 4-burner gas ranges.

Public School 162, St. Nicholas and Willoughby Avenues and Suydam Street—Gas plans filed January 12, 1909; electric plans filed March 4, 1909, for new installation, which will be ready about December 1, 1909: 1,385 50-watt lamps, 4-horse-power electric motor, 745 gas burners, 7 2-burner gas stoves.

Public School 163, Benson Avenue and Bay Fourteenth Street—Gas plans filed January 12, 1909; electric plans filed March 4, 1909, for new installation, which will be ready about September 1, 1909: 1,047 50-watt lamps, 4-horse-power electric motor, 612 gas burners, 15 2-burner gas stoves, 3 1-burner gas stoves, 2 gas ranges.

Public School 164, Fourteenth Avenue and Forty-second Street—Gas plans filed January 12, 1909; electric plans filed March 4, 1909, for new installation, which will be ready about December 1, 1909: 1,440 50-watt lamps, 5-horse-power motor, 805 gas burners, 4 2-burner gas stoves.

Fire Department.

On December 31, 1908, there were in this Borough under the jurisdiction of the Fire Department eighty (80) buildings lighted and five (5) buildings in course of construction which will be ready for lighting during the year 1908.

The installation equivalent of 50-watt lamps was 3,110 and the increased installation contemplated up to December 31, 1909, is 826, making a total of 3,936, an equivalent of 26 per cent.

The following are the locations of buildings in which the additional lighting is contemplated:

Engine 169—New building, Union street, south side, 227 feet west of Seventh avenue. Plans and specifications were filed July 19, 1907, and the building is now completed and partly lighted. Additional installation, which will be ready July 1, will be 75 50-watt lamps.

Engine 117—New building, south side DeKalb avenue, 225 feet west of Lewis avenue. Plans and specifications filed September 30, 1907, and the installation, which will be ready May 1, 1909, will be 60 50-watt lamps, 49 gas burners, 1 2-division clothes-dryer.

Engine 157—New building, southeast corner Rockaway avenue and Avenue F. Plans and specifications filed September 30, 1907, and the installation, which has been in commission since March 15, is 64 50-watt lamps.

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In this section, the gas mains do not run to this building and it is doubtful whether gas will be available before the end of the year but the installation, which will be ready when gas can be turned on, will be 42 gas burners, 2 2-burner clothes-dryers.

Engine 112—New building, Wythe avenue and North Ninth street. Plans and specifications filed April 1, 1907, and the installation, which will be ready about May 1, 1909, will be 72 50-watt lamps, 40 gas burners, 1 2-division clothesdryer.

Engine 171—New building, southeast side of Himrod street, southwest of St. Nicholas avenue. Plans and specifications filed September 20, 1907, and the building is completed and partly lighted. Additional installation, which will be ready June 1, 1909, will be 92 50-watt lamps.

Hook and Ladder 56—New building, No. 124 Greenpoint avenue. Plans and specifications filed August 30, 1907, and installation, which will be ready May 1, 1909, will be 43 50-watt lamps, 42 gas burners, 1 2-division clothesdryer.

Storehouse—New building, Myrtle avenue, north side, 70 feet east of North Elliott place. Plans and specifications filed May 24, 1907, and the building is completed and partly lighted. Installation, which will be ready May 1, 1909, 152 50-watt lamps.

Headquarters—No. 365 Jay street. Application received April 13, 1909, for re-arrangement and additional lighting on third and fourth floors. Additional lighting will be ready about May 1, 1909, and will be 13 50-watt lamps.

Engine 140—Prospect avenue, near Greenwood avenue. New lighting and re-arrangement of present equipment. Plans are now being prepared and the estimated additional installation, which will be ready about December 1, 1909, will be 35 50-watt lamps, 45 gas burners.

Department of Health.

On December 31, 1908, there were in this Borough under the jurisdiction of the Department of Health twelve (12) buildings lighted and ten (10) buildings in course of construction which will be ready for lighting during the year 1909.

The installation equivalent of 50-watt lamps was 2,542, and the increased installation contemplated up to December 31, 1909, is 2,186, making a total of 4,728, an increase of 86 per cent.

The following are the locations of buildings where additional installations are contemplated:

Kingston Avenue Hospital, Kingston Avenue and Rutland Road.

Boiler House—New building. Plans and specifications received July 11, 1906, and the installation which is now ready is 18 50-watt lamps; 15 gas burners.

Disinfecting Station—New building. Plans and specifications received July 11, 1906, and the installation, which is now ready, is 16 50-watt lamps, 42 gas burners.

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[illegible] Plans and specifications received July 13 1906, and the [illegible] will be 111 5-watt lamps, 11 gas burners.

[illegible] Plans and specifications received September 18, 1906, and the [illegible] will be 111 5-watt lamps, 111 gas burners.

[illegible]—Plans and specifications received September 12, 1907, and the [illegible] Pavilion No. 1, 56 5-watt lamps, 4 gas burners; Pavilion No. 2, 84 5-watt lamps, 16 gas burners; Pavilion No. 3, 28 5-watt lamps, 11 gas burners; Pavilion No. 4, 28 5-watt lamps, 11 gas burners.

[illegible]—Plans and specifications received September 30, 1908, and the [illegible] will be ready about November 1, 1909, will be 13 25-watt arcs, 4 125-watt lamps, 3 [illegible]-watt lamps, 111 5-watt lamps, 195 gas burners, 41 [illegible] equivalent to [illegible].

[illegible] lighting of the [illegible] buildings on grounds of the Kings[illegible] Public Parks, the Department of Health and any [illegible] installed [illegible], and the material [illegible] contained by them in compliance with the Electric Department.

[illegible]—New Fleet street. Plans and specifications received August 29, 1908, and the installation, which will be ready by December 1, 1909, will be 497 5-watt lamps, 304 gas burners, 56 [illegible] equivalent to [illegible].

[illegible]—Fifth Ward. Fleet street. Additional lighting now ready, 4 5-watt lamps.

[illegible]—Leased building, No. 351 Throop avenue. This building was leased by the Department of Health from May 1, 1908, and the lighting installation [illegible] gas burners.

## Department of Parks

On December 31, 1908, there were in this Borough under the jurisdiction of the Department of Parks in use or in process of construction 24 buildings Light 1 and Light 8 buildings in course of construction, which will be ready for lighting during the year 1909.

The present total equivalent of 50-watt lamps was 5,564, and the increased installation completed up to December 31, 1909, is 7 7, making a total of 6,211, an increase of 12 per cent.

The following are the locations of buildings in which the additional installation is now complete:

Bolton Park Shelter—Fulton street and Stuyvesant avenue, new building. Plans and specifications were filed July 2, 1907, and the lighting installation, which will be ready about September 1, 1909, will be 23 50-watt lamps, 11 gas burners.

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Tennis Shelter—Prospect Park, northeast of tennis grounds, near west drive. New building. Plans and specifications filed July 2, 1907, and the installation, which will be ready December 1, 1909, will be 147 50-watt lamps, 93 gas burners.

Winthrop Park Shelter—Russell street and Driggs avenue, new building. Plans and specifications filed July 2, 1907, and the installation will be ready about November 1, 1909: 64 50-watt lamps, 22 gas burners.

New Lots Park Shelter—Riverdale avenue and Sackman street. Plans and specifications were filed July 2, 1907, and the installation, which will be ready about November 1, 1909, will be 14 50-watt lamps, 14 gas burners.

Soldiers' and Sailors' Arch—Main entrance to Prospect Park. Plans and specifications filed October 21, 1907, and the installation, which was ready February 24, 1909, is 40 50-watt lamps.

Skating Pavilion—Prospect Park. This is a portable building, which is removed after the skating season is over. The installation, which was put in commission January 11, 1909, and discontinued April 1, 1909, was 69 50-watt lamps.

Martyrs' Monument—Fort Greene Park, head of Willoughby street. This monument has been completed since last October and gas and electric meters have been installed on order of the contractor. It was erected by the United States Government, State of New York, and the Daughters of American Revolution, and was placed in charge of the Park Department in October, at the time it was dedicated. No lighting has so far been furnished by the City, and, so far as I can learn, the Park Department does not seem inclined to request that this Department assume the cost of lighting the monument. On receipt of application, this Bureau will take up the matter of lighting and will recommend necessary changes in the system now installed.

McLaughlin Park Shelter—Jay and Tillary streets, new building. Plans and specifications were filed November 27, 1908, and the installation, which will be ready about September 1, 1909, will be 7 125-watt lamps, 32 50-watt lamps, 5 horsepower motors, 19 gas burners.

## Police Department.

On December 31, 1908, there were in this Borough under the jurisdiction of the Police Department thirty-eight (38) buildings lighted and one (1) in course of construction, which will be ready for lighting during the year 1909.

The installation equivalent of 50-watt lamps was 4,165, and the increased installation contemplated up to December 31, 1909, is 594, making a total of 4,759, an increase of 14 per cent.

The following are the locations of buildings where additional lighting is contemplated:

One Hundred and Seventy-second Precinct Police Station—New building, Lawrence avenue, south side, 75 feet east of East Third street. Plans were filed June 10,

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1907, and the building will probably be ready for lighting by October 1, 1909, the delay being due to legal complications involving the contractors. The installation will be 308 50-watt lamps, 281 gas burners, 2 horsepower electric motor.

Headquarters—No. 269 State street. On March 13, 1908, this Department called the attention of the Police Department to the fact that the wiring throughout this building was badly deteriorated and defective in many instances, and requested that same be overhauled and put in good condition. Specifications covering the necessary work were prepared by this Bureau at the request of the Police Department and the matter was taken up and given prompt attention. The lighting of the building was put in satisfactory condition and complied with all conditions of this Bureau. The additional installation, which was put in commission April 17, 1909, is 1 125-watt lamp, 3 50-watt lamps.

Public Buildings and Offices.

On December 31, 1908, there were in this Borough under the jurisdiction of the Bureau of Public Buildings and Offices, 44 buildings lighted and 5 buildings in course of construction which will be ready for lighting during the year 1909:

The installation equivalent of 50-watt electric lamps was 10,965 and the increased installation contemplated up to December 31, 1909, is 1,200, making a total of 12,165, an increase of 11 per cent.

Kings County Court House—Joralemon street and Fulton street. Plans and specifications were prepared for the complete overhauling and additions to lighting in this building and were filed in this Bureau May 8, 1908. On account of the contract price exceeding the appropriation, the matter was abandoned at the request of the Borough authorities and plans and specifications were prepared by this Bureau for the lighting of the rear portion of the building, which had been damaged by fire in February. Care was taken to equip the fixtures with shades of suitable type, incandescent arcs being used for lighting court rooms and Judges' chambers. The matter of overhauling the wiring in the rest of the building and making it safe has been called to the attention of the Borough authorities with the request that same be taken in hand. The lighting of the law library in this building has been given attention and rearrangement made consisting of the installation of high efficiency lamps with prismatic reflecting glass shades which have given entire satisfaction.

The additional installation now ready in this building consists of 57 50-watt lamps, 24 100-watt lamps.

Borough Hall—Court and Joralemon streets. Additional installation now ready is 16 50-watt lamps.

Municipal Building—Fulton and Joralemon streets. Additional installation now ready is 10 50-watt lamps.

Hall of Records—Fulton street and Boerum place. The Surrogate's Court in this building was lighted by a system of indirect lighting, 199 50-watt lamps being

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placed in a trough 12 feet above the floor and extending all around the room. This system of lighting was very unsatisfactory and application was made to this Bureau for permission to install pendant fixtures in the centre of the room in addition to the present system. This matter was taken up by us with a view to decreasing rather than increasing the watt consumption and plans and specifications were prepared for the installation of 87 1-light brackets equipped with reflecting shades, attached to outside of the trough in which the old system was installed. This new system was completed in February and the old system discontinued. The present system has given entire satisfaction and effected a saving of 56 per cent. in cost of maintenance to this Department. The lighting in the Surrogate's chamber and Chief Clerk's office is now under consideration, the new system of lighting, consisting of 2 incandescent arcs of 6 100-watt lamps each, which will be substituted for the present ceiling lighting, will effect a saving of at least 75 per cent. in cost of maintenance. New installation now ready is 87 50-watt lamps.

Disciplinary Training School for Boys—Eighteenth avenue and Fifty-seventh street. This is the building in which the heating apparatus has been out of order since October, 1905, from which time gas has been burned for heating portions of the building. A contract was awarded for the installing of a new boiler and the overhauling of the entire heating system throughout the building, which work is about completed. This Bureau took up the matter of electric wiring in this building and condemned the entire installation. As a result, a specification was prepared by us, at the request of the Borough authorities covering the entire overhauling of the wiring, panel boards and lighting fixtures, the contract for this work has been awarded and work is in progress.

Interior Bath, New Building—Hamburg and Willoughby avenues. Gas and electric plans were filed in this Bureau April 1, 1907, and the installation which will be ready about July 1, 1909, will be as follows: 212 60-watt lamps, 119 gas burners, 17½ horse power in motors.

Interior Bath, New Building—Northeast corner of Fourth avenue and President street. Gas and electric plans were filed with this Bureau February 2, 1906, and the installation which will be ready about August 1, 1909, will be as follows: 346 50-watt lamps, 52 gas burners, 55 horse power in electric motors.

Civil Prison—No. 113 Schermerhorn street. Owing to some difficulty in obtaining possession of this building, under lease, same may not be occupied, but installation provided for is 40 gas burners, 60 50-watt lamps.

Children's Court—No. 102 Court street. Additional lighting which is now ready is 12 50-watt lamps.

First District Municipal Court, Second Division— No. 104 Court street. Leased premises. Additional installation which will be ready about May 1 will be 48 50-watt lamps.

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Power House, Flushing Tunnel, Gowanus—This building is proposed for construction and the estimated installation will be 40 50-watt lamps, 20 gas burners.

Comfort Station—Lorimer street and Broadway. This comfort station has been closed for the purpose of thoroughly overhauling same, and the supply of current and gas has been discontinued. The plans for new lighting were filed December 23, 1907. and attention has been given to the equipment of high efficiency lamps with proper shades. The installation which will be ready about June 1, 1909, will be 23 50-watt lamps, 18 gas burners.

Department of Street Cleaning.

On December 31, 1908, there were in this Borough under the jurisdiction of the Department of Street Cleaning 35 buildings lighted and 1 building in course of construction which will be ready for lighting during the year 1909.

The installation equivalent of 50-watt lamps was 1,280 and the increased installation contemplated up to December 31, 1909, is 199, making a total of 1,479, an increase of 6½ per cent.

The following are the locations of buildings where the additional lighting is contemplated:-

Stable "A"—Flushing and Kent avenues. This building has been in course of erection for the past five years and is about completed but has not been finally accepted by the City. Lighting and power meters have been installed and the building is being looked after by the employees of the Department of Street Cleaning. I have been in communication with representatives of the Department with a view to rearranging the lighting and have been assured that when the building is accepted, the necessary changes will be made in the lighting to conform with the requirements of this Department.

Application was made for rearrangement of lighting in the basement storerooms of this building on November 2, 1908, and the additional installation which will be ready about September 1, 1909, will be 41 50-watt lamps.

Stable "G"—Utica avenue and Pacific street. Complaint was made by this Department that the electric wiring and appliances in Stable "G" had greatly deteriorated and in many cases were unsafe. We advised that the present method of controlling the lighting did not permit of its economical use and requested that same be given immediate attention. On receipt of request from the Street Cleaning Department, this Bureau formulated plans and specifications for an entirely new installation, wiring to be run in rigid conduit. Bids for same are now being solicited, and the additional installation will be 31 50-watt lamps.

Stable "D"—Kent avenue and North Thirteenth street. This is another building in which similar conditions prevail. The Commissioner of Street Cleaning has promised to give same attention when the necessary plans and specifications are furnished by this Bureau.

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Coney Island Stable—Canal avenue and East Third street. This is a new building and plans for gas and electric lighting were filed with this Bureau on December 3, 1908. Installation will be ready about December 1, 1909, and will be 96 50-watt lamps, 31 gas burners.

Department of Water Supply, Gas and Electricity.

On December 31, 1908, there were in this Borough under the jurisdiction of the Department of Water Supply, Gas and Electricity, twenty (20) buildings lighted and two (2) buildings in course of construction, which will be ready for lighting during the year 1909.

The installation equivalent of 50-watt lamps was 2,482 and the increased installation contemplated up to December 31, 1909, is 1,427, making a total of 3,909, an increase of 58 per cent.

The following are the locations of buildings in which the additional lighting is contemplated:

New Lots Pumping Station—New building, north side of Blake avenue, 275 feet east of Fountain avenue. Plans and specifications were filed October 18, 1907, and the building will probably be ready for lighting December 1, 1909, installation being 65 gas burners, 167 50-watt lamps, 2 arc lamps.

This will be an isolated plant.

Gravesend Pumping Station—New building, northeast corner Avenue S and East Sixteenth street. Plans and specifications were filed October 18, 1907, and the building is now completed and lighted with gas. Additional installation which will be ready September 1, 1909, will be 122 50-watt lamps, 2 arc lamps.

This will be an isolated plant.

Canarsie Pumping Station—Southwest corner Remsen avenue and Avenue D. Plans and specifications were filed October 18, 1907, and the installation which will be completed about December 1, 1909, will be 164 50-watt lamps, 67 gas burners, 2 arc lamps.

Ridgewood Pumping Station—Addition, Atlantic avenue, south side, near Logan street. This addition will probably be ready about December 15, 1909, and the installation will be 282 50-watt lamps, 19 arc lamps, 12½-horsepower electric motor, 100 gas burners.

High Pressure Pumping Station—Joralemon and Furman streets. This building has been completed and lighting installed with the exception of 8 arc lamps to which current has not been furnished pending decision as to use of flaming arcs.

High Pressure Pumping Station—Willoughby and St. Edwards streets. This building is completed and lighting installed with the exception of 8 arc lamps which are being held pending decision as to use of flaming arcs.

Machine Shops—North Portland avenue repair yard. Plans are being prepared for the installation of electric lighting and the installation which will be ready June 1, 1909, will be 50 50-watt lamps.

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Statement Showing the Number of Orders Issued During the Period Between January
Borough of Brooklyn, the Dates of Orders, the Locations of Buildings, New
Charged to the City.

| Building. | Date of Order. | Electric Lamps. | | | | |
|---|---|---|---|---|---|---|
| | | 187 Watt. | 125 Watt. | 100 Watt. | 50 Watt. | 8 C. P. |
| **Armories.** | | | | | | |
| Forty-seventh Regiment, Marcy avenue and Heyward street | Jan. 24 | ... | ... | ... | 31 | ... |
| | Nov. 23 | ... | ... | 2 | 348 | ... |
| Second Battalion, Naval Militia, First avenue, between Fifty-first and Fifty-second streets | Jan. 29 | ... | ... | ... | ... | ... |
| | Nov. 28 | ... | ... | ... | 4 | ... |
| Thirteenth Regiment, Sumner and Putnam avenues | Mar. 30 | ... | ... | ... | ... | 120 |
| | April 18 | ... | ... | ... | 49 | 12 |
| | Oct. 8 | ... | ... | ... | 116 | 43 |
| | Dec. 29 | ... | ... | ... | 50 | ... |
| Fourteenth Regiment, Eighth avenue, between Fourteenth and Fifteenth streets | Sept. 9 | ... | ... | ... | ... | ... |
| Twenty-third Regiment, Bedford and Atlantic avenues | Oct. 23 | ... | ... | ... | 72 | ... |
| Squadron C Armory, Bedford avenue and President street | Dec. 7 | ... | ... | ... | 85 | 12 |
| **Bridges.** | | | | | | |
| Third Street Bridge | June 27 | ... | ... | ... | 11 | ... |
| **Charities.** | | | | | | |
| Reception Hospital, Sea Breeze avenue, 100 feet east of West Third street, Coney Island | Jan. 3 | ... | ... | ... | 39 | ... |
| **Corrections.** | | | | | | |
| City Prison, Raymond and Willoughby streets | Dec. 21 | ... | ... | ... | ... | 448 |
| **Education.** | | | | | | |
| Public School 30, Conover, Walcott and Sullivan streets | Jan. 3 | ... | ... | ... | ... | ... |
| Public School 8, Middagh and Hicks streets | Jan. 3 | ... | ... | ... | 617 | 255 |
| Public School 78, Pacific street, near Court street | Jan. 3 | ... | ... | ... | ... | ... |
| Public School 83, Bergen street and Schenectady avenue | Jan. 3 | ... | ... | ... | 590 | 292 |
| Public School 148, Delmonico place and Ellery street | Jan. 3 | ... | ... | ... | 1,184 | 637 |
| Public School 114, Remsen avenue, between Bay View avenue and School lane, Canarsie | Jan. 3 | ... | ... | ... | 594 | 287 |
| Public School 27, Nelson and Hicks streets | Jan. 3 | ... | ... | ... | 892 | 41 |
| Public School 66, Watkins and Osborn streets, near Sutter avenue | Jan. 3 | ... | ... | ... | 1,300 | 652 |
| Office and Storage, Nos. 131 to 135 Livingston street | Jan. 6 | ... | ... | ... | ... | ... |
| | Feb. 21 | ... | ... | ... | ... | ... |
| | Mar. 30 | ... | ... | ... | ... | ... |
| | Aug. 14 | ... | ... | ... | 433 | 270 |
| Public School 104, Ninety-second street and Gelson avenue | Jan. 3 | ... | ... | ... | ... | ... |
| | Mar. 9 | ... | ... | ... | ... | ... |
| | Mar. 17 | ... | ... | ... | ... | ... |

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1 and December 31, 1908, for New Lighting in Public Buildings Described in the and Added Installations of Electricity; also the Rates at Which Same Will Be

| Arc Lamps. | Gas Burners. | Equivalent of 50 Watt Lamps. | Motors, Horse Power. | Gas Ranges. | Gas Stoves. | Gas Radiators. | Gas Engines, Horse Power. | Miscellaneous. |
|---|---|---|---|---|---|---|---|---|
| ... | ... | 31 | ... | ... | ... | ... | ... | |
| ... | ... | 352 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | ... | 1 clothes dryer. |
| ... | ... | 4 | ... | ... | ... | ... | ... | |
| ... | ... | 60 | ... | ... | ... | ... | ... | |
| ... | ... | 55 | ... | ... | ... | ... | ... | |
| ... | ... | 138 | ... | ... | ... | ... | ... | |
| ... | ... | 50 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 1 | ... | ... | ... | ... | |
| ... | ... | 72 | ... | ... | ... | ... | ... | |
| ... | ... | 91 | ... | ... | ... | ... | ... | |
| ... | ... | 11 | ... | ... | ... | ... | ... | |
| ... | ... | 39 | ... | ... | ... | ... | ... | |
| ... | ... | 224 | ... | ... | ... | ... | ... | |
| ... | 523 | 523 | ... | 2 | 14 2-b | ... | 2 | |
| ... | ... | 745 | 5 | ... | ... | ... | ... | |
| ... | ... | ... | 15 | ... | ... | ... | ... | |
| ... | ... | 736 | 23 | ... | ... | ... | ... | |
| ... | ... | 1,503 | 4 | ... | ... | ... | ... | |
| ... | ... | 738 | 5 | ... | ... | ... | ... | |
| ... | ... | 913 | 3 | ... | ... | ... | ... | |
| ... | ... | 1,626 | 10 | ... | ... | ... | ... | |
| ... | ... | ... | 42 | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | 2 | |
| ... | 532 | 532 | ... | ... | ... | ... | ... | |
| 2 | ... | 668 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 21½ | ... | ... | ... | ... | |
| ... | 432 | 432 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | 2 | 27 1-b<br>4 2-b | 2 | ... | |

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| Arc Lamps. | Gas Burners. | Equivalent of 50 Watt Lamps. | Motors, Horse Power. | Gas Ranges. | Gas Stoves. | Gas Radiators. | Gas Engines, Horse Power. | Miscellaneous. |
|---|---|---|---|---|---|---|---|---|
| ... | ... | 539 | ... | ... | ... | ... | ... | |
| ... | ... | 465 | ... | ... | ... | ... | ... | |
| ... | ... | 613 | ... | ... | ... | ... | ... | |
| ... | ... | 1 | ... | ... | ... | ... | ... | |
| ... | ... | 2 | ... | ... | ... | ... | ... | |
| ... | ... | 2 | ... | ... | ... | ... | ... | |
| ... | ... | 2 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | 2 | 100 light gas meter, laboratory. |
| ... | 1,001 | 1,001 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | 2 | |
| ... | 887 | 887 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | 2 | 18 2-b | ... | ... | 2 Bunson burners. |
| ... | ... | 1,465 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 5 | ... | ... | ... | ... | |
| ... | ... | 3 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | 2 | |
| ... | ... | ... | ... | 2 | 8 2-b | ... | ... | |
| ... | ... | ... | ... | ... | 23 1-b | ... | ... | |
| ... | 809 | 809 | ... | ... | ... | ... | ... | |
| ... | ... | 1,200 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | 2 | |
| ... | ... | 963 | 26½ | ... | ... | ... | ... | |
| ... | ... | ... | ... | 2 | 15 | ... | ... | |
| ... | 512 | 512 | ... | ... | ... | ... | ... | |
| ... | ... | 6 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 7½ | ... | ... | ... | ... | |
| ... | ... | ... | 12½ | ... | ... | ... | ... | |
| ... | ... | 1,516 | 21½ | ... | ... | ... | ... | |
| ... | 704 | 704 | ... | ... | ... | ... | ... | 60 1-meter, laboratory. |
| ... | ... | ... | 7 | ... | ... | ... | ... | |
| ... | ... | 2,223 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 4½ | ... | ... | ... | ... | |
| ... | ... | ... | ... | 2 | 27 1-b | ... | ... | |
| ... | ... | ... | ... | ... | 1 2-b | ... | ... | |
| ... | ... | 465 | ... | ... | ... | ... | ... | |
| ... | 372 | 372 | ... | ... | ... | ... | 25 | |
| ... | ... | ... | ... | ... | ... | ... | 2 | |
| ... | ... | ... | 18½ | ... | ... | ... | ... | |
| ... | 258 | 258 | ... | ... | ... | ... | ... | |
| ... | ... | 369 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 5 | ... | ... | ... | ... | |

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| Building. | Date of Order. | Electric Lamps. 187 Watt. | 125 Watt. | 100 Watt. | 50 Watt. | 8 C. P. |
|---|---|---|---|---|---|---|
| Public School 140, Sixtieth street, west of Fourth avenue | Oct. 1 | ... | ... | ... | ... | ... |
| Public School 85, Evergreen avenue and Covert street | Sept. 4 | ... | ... | ... | ... | ... |
| Public School 5, Bridge and Lawrence streets.. | Sept. 26 | ... | ... | ... | ... | ... |
| | Oct. 1 | ... | ... | ... | ... | ... |
| | Sept. 23 | ... | ... | ... | 1,354 | 467 |
| | Dec. 4 | ... | ... | ... | ... | ... |
| Public School 155, Eastern parkway and Herkimer street | Sept. 23 | ... | ... | ... | ... | ... |
| | Nov. 27 | ... | ... | ... | ... | ... |
| | Dec. 23 | ... | ... | ... | 1,004 | 316 |
| Public School 43, Boerum street, near Manhattan avenue | Oct. 1 | 160 | 100 | ... | 102 | 133 |
| Public School 66, Osborn street, near Sutter avenue | Oct. 5 | ... | ... | ... | ... | ... |
| Public School 159, Pitkin avenue and Hemlock street | Nov. 27 | ... | ... | ... | ... | ... |
| Public School 154, Eleventh avenue and Windsor place | Dec. 4 | ... | ... | ... | ... | ... |
| Public School 10, Seventh avenue and Seventeenth street | Dec. 11 | ... | ... | ... | ... | ... |
| Public School 80, West Seventeenth street, near Neptune avenue | Dec. 12 | ... | ... | ... | 197 | ... |
| Public School 109, Dumont avenue and Powell street | Dec. 11 | ... | ... | ... | ... | ... |
| Public School 143, Havemeyer and North Sixth street | Dec. 17 | ... | ... | ... | ... | ... |
| **Fire.** | | | | | | |
| Engine 120, Eleventh street, near Seventh avenue | Jan. 3 | ... | ... | ... | 58 | 23 |
| Storehouse, Myrtle avenue, near North Elliott place | May 18 | ... | ... | ... | ... | ... |
| Engine 117, temporary quarters southwest corner of Tompkins and DeKalb avenues | July 5 | ... | ... | ... | ... | ... |
| Engine 112, temporary quarters Wythe avenue, north of North Ninth street | July 3 | ... | ... | ... | ... | ... |
| Engine 169, No. 786 Union street | Sept. 18 | ... | ... | ... | ... | ... |
| Engine 171 and Hook and Ladder 74, Himrod street and St. Nicholas avenue | Sept. 18 | ... | ... | ... | ... | ... |
| **Health.** | | | | | | |
| Headquarters Building, Nos. 38 and 40 Clinton street | Feb. 26 | ... | ... | ... | 7 | ... |
| Kingston Avenue Hospital, Measles Pavilion, Kingston avenue and Rutland road | July 3 | ... | ... | ... | ... | ... |
| | July 3 | ... | ... | ... | 514 | ... |
| **Parks.** | | | | | | |
| Skating House, Prospect Park | Feb. 3 | ... | ... | ... | 60 | ... |
| Comfort Station, main entrance Prospect Park.. | Oct. 21 | ... | ... | ... | ... | 21 |
| | Nov. 27 | ... | ... | ... | ... | ... |
| Sunset Park Shelter House, Forty-fourth street, west of Sixth avenue | Nov. 20 | ... | ... | ... | ... | ... |

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| Arc Lamps. | Gas Burners. | Equivalent of 50 Watt Lamps. | Motors, Horse Power. | Gas Ranges. | Gas Stoves. | Gas Radiators. | Gas Engines, Horse Power. | Miscellaneous. |
|---|---|---|---|---|---|---|---|---|
| ... | ... | ... | ... | 2 | 15 2-b | ... | ... | |
| ... | ... | ... | ... | 2 | 24 1-b | ... | ... | 1 water heater. |
| ... | ... | ... | ... | ... | ... | ... | 2 | |
| ... | ... | ... | ... | 2 | 11 2-b | ... | ... | |
| ... | ... | 1,592 | 5½ | ... | ... | ... | ... | |
| ... | 963 | 963 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 5½ | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | 6 2-b | ... | ... | |
| ... | ... | 1,162 | ... | ... | ... | ... | ... | |
| ... | ... | 1,019 | ... | ... | ... | ... | ... | |
| ... | 985 | 985 | ... | ... | ... | ... | ... | |
| ... | 644 | ... | ... | ... | 4 2-b | ... | ... | |
| ... | ... | ... | ... | ... | 4 2-b | ... | ... | |
| ... | ... | ... | 20 | ... | ... | ... | ... | |
| ... | ... | 197 | ... | ... | ... | ... | ... | |
| ... | 1,360 | 1,360 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 2 | ... | ... | ... | ... | |
| ... | ... | 70 | ... | ... | ... | ... | ... | |
| ... | 29 | 29 | 35 | ... | ... | ... | ... | |
| ... | 10 | ... | ... | ... | ... | ... | ... | Gas heater apparatus. |
| ... | 10 | ... | ... | ... | ... | ... | ... | Gas heater for apparatus. |
| ... | 38 | 38 | ... | ... | ... | ... | ... | Clothes dryer. |
| ... | 78 | 78 | ... | ... | ... | ... | ... | 2 clothes dryers. |
| ... | ... | 7 | ... | ... | ... | ... | ... | |
| ... | 383 | 383 | ... | ... | ... | ... | ... | |
| ... | ... | 514 | 10 | ... | ... | ... | ... | |
| ... | ... | 60 | ... | ... | ... | ... | ... | |
| ... | ... | 11 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 2 | ... | ... | ... | ... | |
| ... | 19 | 19 | ... | ... | ... | ... | ... | |

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| Building. | Date of Order. | Electric Lamps. | | | | |
|---|---|---|---|---|---|---|
| | | [illegible] Watt. | [illegible] Watt. | [illegible] Watt. | 50 Watt. | 8 C. P. |
| Comfort Station, Fort Greene Park | Nov. 23 | ... | ... | ... | 29 | ... |
| Garage, Prospect Park | Dec. 29 | ... | ... | ... | 12 | ... |
| **Police.** | | | | | | |
| Mounted Traffic Squad, No. 118 Waverly avenue | July 29 | ... | ... | ... | ... | ... |
| Harbor Precinct Station C, Warner's Dock, Garage | Oct. 14 | ... | ... | ... | 5 | ... |
| Headquarters, No. 261 State street | Oct. 23 | ... | ... | ... | 8 | ... |
| **Public Buildings.** | | | | | | |
| Borough Hall, Joralemon and Fulton streets | April 13 | ... | ... | ... | 25 | ... |
| Bath— | | | | | | |
| Dock street | June 9 | ... | ... | ... | ... | ... |
| North First street | June 9 | ... | ... | ... | ... | ... |
| Noble street | June 9 | ... | ... | ... | ... | ... |
| Conover street | June 9 | ... | ... | ... | ... | ... |
| Storehouse, No. 874 Willoughby street | July 9 | ... | ... | ... | ... | ... |
| | July 21 | ... | ... | ... | 19 | ... |
| Municipal Asphalt, foot of Sixth street | Oct. 23 | ... | ... | ... | 9 | ... |
| Court of Special Sessions, No. 171 Atlantic avenue | Oct. 28 | ... | ... | ... | ... | ... |
| | Oct. 28 | ... | ... | ... | 121 | ... |
| Kings County Court House, Fulton and Joralemon streets | Oct. 27 | ... | ... | ... | 3 | ... |
| | Nov. 4 | ... | ... | ... | 100 | ... |
| | Dec. 28 | 2 | 6 | ... | 143 | ... |
| **Street Cleaning.** | | | | | | |
| Stable A, Flushing and Kent avenues | Jan. 3 | ... | ... | ... | ... | ... |
| | Sept. 26 | ... | ... | ... | 298 | ... |
| | Sept. 26 | ... | ... | ... | ... | ... |
| Stable B, Butler street, between Fourth and Fifth avenues | Mar. 13 | ... | ... | ... | 3 | ... |
| Stable E, northeast corner of Jamaica avenue and Gillen place | Mar. 13 | ... | ... | ... | 2 | ... |
| Stable C, Nostrand avenue and Sterling place | July 27 | ... | ... | ... | 105 | ... |
| **Water Supply, Gas and Electricity.** | | | | | | |
| Photometric Station, No. 1784 Shore road, Sheepshead Bay | Jan. 3 | ... | ... | ... | ... | ... |
| High Pressure Fire Service Pumping Station, St. Edwards and Willoughby streets | Jan. 4 | ... | ... | ... | ... | ... |
| | Mar. 18 | ... | ... | ... | ... | ... |
| Coney Island High Pressure Fire Service Station, Neptune avenue and West Twelfth street | April 10 | ... | ... | ... | 5 | ... |
| | July 21 | ... | ... | ... | ... | ... |
| Gravesend Pumping Station, northeast corner of East Sixteenth street and Avenue S | April 16 | ... | ... | ... | ... | ... |
| Main High Pressure Fire Service Station, Furman and Joralemon streets | July 23 | ... | ... | ... | ... | ... |
| | Sept. 5 | ... | ... | ... | ... | ... |
| | Oct. 12 | ... | ... | ... | 210 | ... |
| Mount Prospect Laboratory, Flatbush avenue, east of Eastern parkway | Aug. 3 | ... | ... | ... | ... | ... |

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| Arc Lamps. | Gas Burners. | Equivalent of 50 Watt Lamps. | Motors, Horse Power. | Gas Ranges. | Gas Stoves. | Gas Radiators. | Gas Engines, Horse Power. | Miscellaneous. |
|---|---|---|---|---|---|---|---|---|
| ... | ... | 29 | ... | ... | ... | ... | ... | |
| ... | ... | 12 | ... | ... | ... | ... | ... | |
| ... | 27 | 27 | ... | ... | ... | ... | ... | |
| ... | ... | 5 | ... | ... | ... | ... | ... | |
| ... | ... | 8 | ... | ... | ... | ... | ... | |
| ... | ... | 25 | ... | ... | ... | ... | ... | |
| ... | 28 | 28 | ... | ... | ... | ... | ... | |
| ... | 28 | 28 | ... | ... | ... | ... | ... | |
| ... | 28 | 28 | ... | ... | ... | ... | ... | |
| ... | 28 | 28 | ... | ... | ... | ... | ... | |
| ... | 2 | 2 | ... | ... | ... | ... | ... | |
| ... | ... | 10 | ... | ... | ... | ... | ... | |
| ... | ... | 9 | ... | ... | ... | ... | ... | |
| ... | 92 | 92 | ... | ... | ... | ... | ... | |
| ... | ... | 121 | ... | ... | ... | ... | ... | |
| ... | ... | 3 | ... | ... | ... | ... | ... | |
| ... | ... | 100 | ... | ... | ... | ... | ... | |
| ... | ... | 165 | ... | ... | ... | ... | ... | |
| ... | ... | ... | 48 | ... | ... | ... | ... | |
| 16 | ... | 458 | ... | ... | ... | ... | ... | |
| ... | 136 | 136 | ... | ... | ... | ... | ... | |
| ... | ... | 3 | ... | ... | ... | ... | ... | |
| ... | ... | 2 | ... | ... | ... | ... | ... | |
| ... | ... | 105 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | .... | 5 1-meter gas. |
| ... | ... | ... | ... | ... | ... | ... | ... | 1,830 kilowatts at 6,600 volts. |
| ... | 30 | 30 | ... | ... | ... | ... | ... | |
| ... | ... | 5 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | ... | 6 horse power, 220-volt motor. |
| ... | 51 | 51 | ... | ... | ... | ... | ... | |
| ... | ... | ... | ... | ... | ... | ... | ... | 5 800 horse power, 6,600-volt motors. |
| ... | 45 | 45 | ... | ... | ... | ... | ... | |
| ... | ... | 210 | 42 | ... | ... | ... | ... | |
| ... | ... | ... | 2⅛ | ... | ... | ... | ... | |

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Summary of Increased Installations Equivalent to 50-Watt Lamps.

| | | | |
|---|---|---|---|
| Armories | 853 | Health | 904 |
| Bridges | 11 | Parks | 131 |
| Charities | 39 | Police | 40 |
| Correction | 224 | Public Buildings | 639 |
| Education | 31,441 | Street Cleaning | 704 |
| Fire | 215 | Water Supply, Gas and Electricity. | 341 |
| | | | 35,542 |

Edison Electric Illuminating Company.

Cost of electric current for lighting, 9½ cents per kilowatt hour.

Cost of electric current for power, 6 cents per kilowatt hour.

Flatbush Gas Company.

Cost of electric current for lighting, 10 cents per kilowatt hour.

Cost of electric current for power, 10 cents per kilowatt hour.

Cost of gas for lighting and power, 75 cents per 1,000 cubic feet.

Brooklyn Union Gas Company.

Cost of gas for lighting and power, 75 cents per 1,000 cubic feet.

Kings County Lighting Company.

Cost of gas for lighting and power, $1 per 1,000 cubic feet.

Brooklyn Borough Gas Company.

Cost of gas for lighting and power, 75 cents per 1,000 cubic feet.

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## BUREAU OF ELECTRICAL INSPECTION.

Bureau of Electrical Inspection,
Nos. 13 to 21 Park Row,
New York, May 17, 1909.

Mr. C. F. LACOMBE, Chief Engineer of Light and Power:

Dear Sir—I beg to submit herewith a schedule showing the operations of the Bureau of Electrical Inspection during the year 1908. This is the first time that such a report has been prepared in consolidated form, and it shows how past methods and details of reporting have differed among the Boroughs. The adoption of a uniform scheme for these reports will facilitate ready comparisons of one Borough with another in the future.

### Consolidation of Bureaus.

Many advantages accrue from the consolidation on October 2, 1908, of the heretofore independent Bureaus of Electrical Inspection. It now becomes possible for the first time to secure a uniformity of rules and rulings throughout the five Boroughs; and this operates to the advantage of the contractor who undertakes an installation in some Borough other than the one in which he ordinarily works. It also relieves the Department as a whole from the embarrassment occasioned in the past by a diversity of rulings throughout the Boroughs. Under the new regime the Electrical Engineer goes weekly from Borough to Borough and confers with the Chief Inspector upon the latter's own ground, and circulars relating to technical matters are forwarded from day to day to each Chief Inspector.

It has become possible to collect without friction, delay or undue inaccuracy a mass of statistics relative to the electrical inspection situation in the entire City, and a grasp of these statistics is enabling the Chief Engineer of Light and Power to devise plans calculated to add materially to the efficiency and economy with which our work is conducted.

It is now practicable and even easy to bring about much desired conferences between this Bureau and the other electrical interests. All parties can meet fairly on the common ground of engineering and report their conclusions to their superiors, who set the policy.

The statistics already accumulated show clearly that while the Manhattan and The Bronx office has attempted by increasing the force from time to time to keep pace with the remarkable development of the electrical industry, the other Boroughs have not done so and are now badly undermanned. In order to do anything toward carrying out the duties imposed upon us by the Charter, more Inspectors must be added, for our present performance is hardly more than a pretense. In Richmond, for instance, with 600 miles of pole line, 205 public buildings and places of amusement and a territory of 52 square miles, there is not a single employee who belongs legitimately to the Bureau of Electrical Inspection, and there is no payroll for our

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Bureau in that Borough. For eleven years we have been carrying on our work there by borrowing the services of employees of the Bureau of Lamps and Lighting. In Brooklyn we have fewer Inspectors than we had five years ago. The appeals of the Chief Inspector of Queens for more Inspectors seem to have remained unheeded, while The Bronx shows clearly that it has been merely a step-child of the Manhattan office and has had the use of such Inspectors as Manhattan has been able to spare. An increase in our force is imperative.

## Advisory Board.

The Chief Engineer of Light and Power, the Electrical Engineer and the Consulting Electrical Engineer constitute an informal committee known as the Advisory Board, whose duty it is to make electrical engineering recommendations to the Commissioner. So far these recommendations have been subscribed to unanimously, and it is our policy to refrain, whenever practicable, from sending forward a report that is not unanimous. It is believed that the rulings themselves are better than they used to be, because one-man opinions no longer prevail in any Borough.

The greater breadth of vision that results from considering the needs of all five Boroughs instead of only one, and the greater assurance of correctness of judgment that goes with the concurrent opinions of three engineers instead of the individual opinion of one, demand and secure for the Department that measure of respect which has so long been desired.

## Interior Conductors.

For the purpose of carrying on the inspection of electrical wiring and appliances introduced into buildings we have a force of 29 Inspectors, distributed as follows:

| | |
|---|---|
| Manhattan and The Bronx | 19 |
| Brooklyn | 7 |
| Richmond | .. |
| Queens | 3 |

This force is not sufficient even to keep up properly with the new work, and little or nothing is done now, except in the case of theatres and moving picture machine establishments, toward making that resurvey of old equipments which is so urgent, for in the disarrangement or natural deterioration of these old equipments lies the greater part of the danger to be apprehended from electricity.

While a careful analysis has been made of the condition of the Bureau, no recommendation has yet been made to you in detail for additional employees, it being hoped that by delaying the subject a way might be found to meet the requirements with a smaller increase in the force than our statistics show to be absolutely necessary. This matter will be explained at greater length under the heading "Working Agreement with the New York Board of Fire Underwriters."

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## Moving Picture Machines.

To this Bureau, as to nearly all branches of the City government, this situation has been a source of serious concern. The combination of a highly inflammable film, a faulty machine or careless operator, a building hastily and perhaps somewhat indifferently adapted to serve as a small theatre, a packed assemblage—principally of women and children sitting in the dark—is not reassuring to contemplate, especially if one has any official relation thereto, and, consequently, responsibility therefor. It is, therefore, with a feeling of extreme thankfulness that attention is called to the fact that so far as can be ascertained no person as yet in The City of New York has lost his life or been seriously injured through any electrical defect in a moving picture establishment.

In connection with this branch of our work, it has been necessary to devote to the examination of persons desiring to operate these machines much time that could ill be spared from other duties. It is satisfactory to know that more than fifty per cent. of those actually examined were found to be incompetent and that, therefore, the labor was well worth while.

## Electrical Code.

Shortly before the close of the year the Department became aware of a suggestion which had been submitted to the Building Code Revision Commission, under which suggestion a third and independent series of electrical inspections would come into play in The City of New York, there being already a double system—the legal and official one of this Bureau and the private one of the Fire Underwriters. The proposed extra set of inspections would have entailed upon the taxpayers a very large additional expense per year without resulting in any corresponding advantage, if there were any advantage at all.

I am happy to state that through this Department's efforts, backed by almost all the electrical interests in the City, the suggestion was withdrawn.

For the last eleven years the Department has had one set of rules constituting its inspection standard, and the Underwriters have had another set, known as the National Electrical Code, upon which they base their inspections. This double standard has been the source of serious annoyance to contractors, Inspectors and even to the public, and at no time prior to last October has it been possible to effect any amelioration of this condition. This is one of the first points taken up in the Bureau, and it gives me pleasure to predict that within a short time the National Electrical Code, with such few modifications as local laws or environment render necessary, will be adopted by the Department for the City, as it has already been adopted by many other municipalities. This Code is recognized generally throughout the United States and Canada as representing the concensus of opinion of the Fire Underwriters, municipal Inspectors, manufacturers and contractors.

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Working Agreement With the New York Board of Fire Underwriters.

A preliminary analysis last fall of the duties, personnel and territory of this Bureau indicated unmistakably an immediate doubling of the inspecting force as the only means by which it might reasonably be held to any sort of accountability for the proper discharge of the duties imposed upon it. Realizing that it would be wrong to make requisition for such a large increase in the force if any alternative could be found, it appeared that if it were legal for the Commissioner to certify the certificates of the New York Board of Fire Underwriters on premises involving fire risks only, some of the Inspectors might be released from their present duties and be assigned to the inspection of life risks or places of public assemblage where fire or panic might occur.

The Corporation Counsel has advised favorably on this matter and negotiations with the New York Board are in progress.

Overhead Wires.

For this branch of the work there are only nine Inspectors available in the Greater City.

Outside of Manhattan, where few pole lines exist, there is very much to be done toward improving the pole line conditions. Throughout the City there are between 3,000 and 4,000 miles of pole lines, and while many of these lines must remain for some years to come and even be extended to meet the development of the suburban districts, many of the lines are located in the more congested districts where the only excuse for their continuance lies in our inability to force the Fire Department to aid us in compliance with the requirements of the Charter and of the various subway acts.

If it were not a misdemeanor to tamper with a fire alarm telegraph wire, a pole-chopping gang, similar to the one that made electrical history for New York some twenty years ago, would have enabled the Department to proceed much further than it has done in carrying out the duties imposed upon it by the subway acts, the Charter and the Board of Estimate and Apportionment.

In thus blaming the Fire Department for its failure to aid our Department in the burial of wires, more particularly in Brooklyn, it is a pleasure, on the other hand, to testify to the courteous and valuable aid which has almost invariably been extended to us by the Fire Marshal's office and the Bureau of Violations of the Fire Department.

It cannot be hoped that the city will be cleared of all pole lines for many years to come, as the situation in the suburbs is generally not favorable for subway construction. The Bureau's energies should be devoted, therefore, to providing the fewest number and the least objectionable type of poles. It has been found to be impossible to secure, under private ownership, the construction of pole lines with a

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view to the future and general needs of the district instead of to the immediate and special needs of the corporation undertaking the construction. The endeavor is being made to secure a partial improvement in existing conditions through the adoption of so-called combination lines, i. e., lines carrying electric light and power wires and wires for signalling upon the same poles, although on separate cross-arms. There is absolutely no engineering objection to such a line if installed under proper specifications, and there are a great many advantages from the standpoint of appearance and even of safety. The Bureau has been in constant consultation with the various electric corporations, in order to determine the requirements of these corporations, and a set of specifications has been prepared and is now under consideration.

## Subways.

As stated last year, in the more congested districts, owing to former extravagant use of the subsurface space, it is becoming very difficult to arrange for subway construction under certain highways. In the suburbs, on the other hand, no way has been found to force an unwilling corporation to extend its underground lines into territory where the financial prospects were not alluring. For these two reasons it is believed that the City will finally resort to the municipal ownership of all wire-carrying subways.

In Manhattan and The Bronx public subway companies exist, acting as the agents of the City. In the other boroughs, however, each company is empowered to construct its own subway. Thus constructive and destructive legislation will be required to put the situation on an improved basis.

## New York Central Transmission Lines.

An anomalous condition is to be found in the operation by the New York Central Railroad of 11,000-volt overhead transmission lines within the City limits, along the rights of way of the Hudson River and Harlem Divisions. It appears that several years ago the railroad company requested our Department to issue permits for the wires, cables, etc., rendered necessary by the electrification of the Grand Central Station terminal zone. The Commissioner refused to sanction the placing over our highways of wires carrying this voltage, so the railroad company did the work without permission.

It was hoped by the Department authorities that the newly created Public Service Commission would be able and willing to assist the Department in securing the removal of these wires, in accordance with the Subway Acts as passed by the Legislature. The Charter itself gives to our Commissioner the determination of whether extensions of lines on our highways shall be by means of overhead or underground conductors, and the Commissioner had determined (as had two of his immediate predecessors) that it was unsafe and improper for these wires to be placed overhead at the highway crossings. A complication arose through the fact that the Commissioner deemed it undesirable to require the wires to be buried at the highways if they were to remain overhead along the right of way.

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The Public Service Commission, in spite of the law, decided that it would be unjust and unfair to require the burial of the wires. In the future, therefore, until an accident occurs to change their opinion, the railways will continue to use 11,000 volts over the streets without permission from the City. Since the decision several extensions of these lines have been made and others contemplated, against the protests of this Department.

The matter was duly reported to the Board of Estimate and Apportionment, the Corporation Counsel stating in his opinion the following:

"While, however, in my opinion, the action of the Public Service Commission has in no way limited the powers of the City, that body has, in a measure, in holding that the system of the said railroad is operated safely, taken upon itself responsibility for all accidents which may occur by reason of the operation of the road by overhead electrical conductors. The question is one of fact and judgment, and holding as it has, after full examination, the Public Service Commission has undoubtedly largely relieved the City authorities of responsibility. As long, however, as jurisdiction remains in your Board (i. e., Board of Estimate and Apportionment) and the Commissioners over street crossings, you cannot entirely escape responsibility, and you may, if you so desire, reject or ignore the decision of the Public Service Commission and pass upon the whole question de novo."

The entire question, therefore, has now passed out of the hands of the Department and rests with the Board of Estimate and Apportionment.

## Reorganization.

It is intended to adopt, as rapidly as may be found consistent with proper consideration of various local conditions, a standard system of office routine applicable to all Boroughs. In this we are of necessity making haste slowly.

The personnel on the whole is fair and can be made better by proper encouragement.

The reorganization seems to have brought with it a spirit of hopefulness, which, if encouraged by suitable rewards for the most worthy, an increase in the force and a rehabilitation of some of the offices, it is hoped will result in greater efficiency and more contented and better service.

Respectfully,

H. S. WYNKOOP, Electrical Engineer.

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## Tabulation of Operations of the Bureau of Electrical Inspection for the Year 1908.

### Interior Wiring and Appliances.

| | Manhattan and The Bronx. | Brooklyn. | Queens. | Richmond. | Total. |
|---|---|---|---|---|---|
| Applications received | 30,638.00 | 12,118.00 | 2,793.00 | 622.00 | 46,171.00 |
| Applications refused | ..... | 1,868.00 | 696.00 | ..... | ..... |
| Certificates issued | 29,092.00 | 10,328.00 | 2,436.00 | 598.00 | 42,454.00 |
| Equipment Covered by Certificates Issued— | | | | | |
| Incandescent lamps | 725,536.00 | 387,086.00 | 99,621.00 | 11,909.00 | 1,224,152.00 |
| Arc lamps | 7,747.00 | 2,777.00 | 537.00 | 36.00 | 11,097.00 |
| Motors: | | | | | |
| Number | 10,642.00 | 2,580.00 | 356.00 | 52.00 | 13,630.00 |
| Horse power | 43,247.00 | 17,872.50 | 2,958.52 | 491.94 | 64,569.96 |
| Generators: | | | | | |
| Number | 146.00 | 74.00 | 25.00 | ..... | 245.00 |
| Kilowatts | 46,378.25 | 12,790.25 | 1,957.75 | ..... | 61,126.25 |
| Electric signs | ..... | 431.00 | ..... | ..... | ..... |
| Motion picture machines | ..... | 296.00 | ..... | ..... | ..... |
| Services | ..... | 1,271.00 | ..... | ..... | ..... |
| Miscellaneous appliances | 238.00 | ..... | 34.00 | 37.00 | ..... |
| Certification of Motion Picture Machine Operators— | | | | | |
| Applications received | ..... | *332.00 | ..... | ..... | ..... |
| Applicants examined | ..... | 200.00 | ..... | ..... | ..... |
| Applicants rejected | ..... | 113.00 | ..... | ..... | ..... |
| Applicants approved | ..... | 87.00 | ..... | ..... | ..... |

*Examinations began on July 29.

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## Exterior Electrical Construction.

| | Manhattan and The Bronx. | Brooklyn. | Queens. | Richmond. | Total. |
|---|---|---|---|---|---|
| Applications received | ..... | *12,333.00 | ..... | *1,286.00 | ..... |
| Applications refused | ..... | 149.00 | ..... | ..... | ..... |
| Permits issued | 20,493.00 | *12,262.00 | 3,617.00 | *1,393.00 | 37,765.00 |
| Construction Covered by Permits Issued— | | | | | |
| Number of poles erected | 292.00 | 2,362.00 | 3,480.00 | ..... | ..... |
| Number of poles removed | ..... | 1,386.00 | 132.00 | ..... | ..... |
| Miles of overhead wires strung | ..... | ..... | 442.40 | ..... | ..... |
| Miles of overhead wires removed | 1,641.87 | 1,165.11 | 888.79 | ..... | ..... |
| Miles of subway constructed, trench | 21.77 | 13.82 | 1.33 | ..... | ..... |
| Miles of subway constructed, ducts | 113.12 | 106.40 | 5.67 | ..... | ..... |
| Miles of underground conductors laid | ..... | 26,250.86 | 2,495.89 | ..... | ..... |
| Miles of gas mains laid | ..... | 22.27 | ..... | ..... | ..... |

*Includes applications and permits for the laying of gas mains. After October 31 the Chief Engineer's office assumed control over this work.

## Inspections.

| | Manhattan and The Bronx. | Brooklyn. | Queens. | Richmond. | Total. |
|---|---|---|---|---|---|
| Interior inspections reported | 90,229.00 | 32,134.00 | 39,937.00 | 2,368.00 | ..... |
| Exterior inspections reported | 23,437.00 | ..... | | 2,040.00 | ..... |
| Number of violation notices issued | 6,210.00 | 1,745.00 | 552.00 | 200.00 | 8,707.00 |
| Number of violations cleared | ..... | ..... | 574.00 | ..... | ..... |

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Department of Water Supply, Gas and Electricity,
Borough of Richmond,
New Brighton, N. Y., February 5, 1909.

Hon. JOHN H. O'BRIEN, Commissioner of Water Supply, Gas and Electricity, No. 21 Park Row, New York City, N. Y.:

Dear Sir—The following is a report of the transactions of the Bureau of Water Supply, Department of Water Supply, Gas and Electricity, Borough of Richmond, for the year ending December 31, 1908.

Respectfully,

J. E. BOWE, Deputy Commissioner.

Statement of Vouchers.

Administration, Office of Deputy Commissioner, Salaries and Wages.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $4,700 00 |
| Total amount of vouchers drawn against account for first quarter. | $887 49 | |
| Total amount of vouchers drawn against account for second quarter | 871 65 | |
| Total amount of vouchers drawn against account for third quarter.. | 624 99 | |
| Vouchers Drawn Against Account, Quarter Ending December 31, 1908— | | |
| Chargeable to: | | |
| Payroll, month of October | 263 16 | |
| Payroll, month of November | 308 33 | |
| Payroll, month of December | 308 33 | |
| Total | | 3,263 95 |
| Estimated balance | | $1,436 05 |

Administration, Office of Chief Engineer, Salaries and Wages.

| | |
|---|---|
| Appropriation for year 1908 | $100 00 |
| Total amount of vouchers drawn against account for first quarter.. ..... | |
| Total amount of vouchers drawn against account for second quarter. ..... | |
| Total amount of vouchers drawn against account for third quarter.. ..... | |
| Estimated balance | $100 00 |

Collection and Storage, Pumping Stations, Salaries and Wages.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $30,000 00 |
| Total amount of vouchers drawn against account for first quarter.. | $6,956 12 | |
| Total amount of vouchers drawn against account for second quarter. | 8,063 16 | |
| Total amount of vouchers drawn against account for third quarter... | 8,522 31 | |

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Drawn Against Account, Quarter Ending December 31, 1908—

Chargeable to:

| | | |
|---|---|---|
| Payroll, week ending October 7 | $436 00 | |
| Payroll, week ending October 14 | 443 50 | |
| Payroll, month ending October 31 | 937 00 | |
| Payroll, week ending October 21 | 440 00 | |
| Payroll, week ending October 28 | 418 50 | |
| Payroll, week ending November 4 | 445 00 | |
| Payroll, week ending November 11 | 439 00 | |
| Payroll, week ending November 18 | 425 00 | |
| Payroll, month ending November 30 | 814 50 | |
| Payroll, week ending November 25 | 440 00 | |
| Payroll, week ending December 2 | 399 94 | |
| Payroll, week ending December 9 | 432 00 | |
| Payroll, week ending December 16 | 425 00 | |
| Payroll, month ending December 31 | 704 50 | |
| Payroll, week ending December 23 | 403 00 | |
| Payroll, eight days ending December 31 | 473 50 | |
| | | 31,618 03 |
| Estimated deficiency | | $1,618 03 |

Distribution, Water Registration, Permits and Revenue Collection, Salaries and Wages.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $3,700 00 |
| Total amount of vouchers drawn against account for first quarter | $924 99 | |
| Total amount of vouchers drawn against account for second quarter | 924 99 | |
| Total amount of vouchers drawn against account for third quarter | 924 99 | |

Vouchers Drawn Against Account, Quarter Ending December 31, 1908—

Chargeable to:

| | | |
|---|---|---|
| Salaries, month of October | 308 33 | |
| Salaries, month of November | 308 33 | |
| Salaries, month of December | 308 33 | |
| | | 3,699 96 |
| Estimated balance | | $0 04 |

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Distribution, Maintenance, Salaries and Wages.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $100 00 |
| Total amount of vouchers drawn against account for first quarter.. | ..... | |
| Total amount of vouchers drawn against account for second quarter. | ..... | |
| Total amount of vouchers drawn against account for third quarter.. | ..... | |
| Estimated balance | | $100 00 |

Collection and Storage, Pumping Stations, Repairs and Renewals.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $1,500 00 |
| Total amount of vouchers drawn against account for first quarter.. | ..... | |
| Total amount of vouchers drawn against account for second quarter | ..... | |
| Total amount of vouchers drawn against account for third quarter | $40 90 | |
| Vouchers Drawn Against Account Quarter Ending December 31, 1908— | | |
| In favor of: | | |
| Donegan & Swift | 92 50 | |
| T. H. Tyrrell | 8 25 | |
| | | 141 65 |
| Estimated balance | | $1,358 35 |

Distribution, Maintenance, Pipes, Hydrants, etc.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $500 00 |
| Total amount of vouchers drawn against account for first quarter.. | ..... | |
| Total amount of vouchers drawn against account for second quarter | ..... | |
| Total amount of vouchers drawn against account for third quarter | ..... | |
| Estimated balance | | $500 00 |

Distribution, Maintenance, Fire Hydrant Rentals and Water Purchased.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $360 00 |
| Total amount of vouchers drawn against account for first quarter.. | ..... | |
| Total amount of vouchers drawn against account for second quarter | ..... | |
| Total amount of vouchers drawn against account for third quarter | ..... | |
| Vouchers Drawn Against Account Quarter Ending December 31, 1908— | | |
| In favor of: | | |
| Staten Island Water Supply Company | $7,687 50 | |
| South Shore Water Works Company | 180 00 | |

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| | | |
|---|---|---|
| Outstanding Liabilities— | | |
| Staten Island Water Supply Company | 7,687 50 | |
| South Shore Water Works Company | 180 00 | |
| Crystal Water Company (estimated) | 15,000 00 | |
| Total | | 30,735 00 |
| Total estimated deficiency | | $30,375 00 |

Distribution, Maintenance, Supplies and Contingencies.

| | | |
|---|---|---|
| Appropriation for year 1908 | | $7,500 00 |
| Total amount of vouchers drawn against account for first quarter | $410 51 | |
| Total amount of vouchers drawn against account for second quarter | 2,308 04 | |
| Total amount of vouchers drawn against account for third quarter. | 3,428 17 | |
| Vouchers Drawn Against Account Quarter Ending December 31, 1908— | | |
| In favor of: | | |
| Typewriter Economy Company | $2 50 | |
| John Scherb | 10 00 | |
| Daniel J. Haggerty | 75 00 | |
| Frank P. Tormey | 9 60 | |
| George W. DuBois | 549 00 | |
| New York and New Jersey Telephone Company | 62 35 | |
| Daniel J. Haggerty | 75 00 | |
| John Scherb | 8 00 | |
| Carlin Brothers | 33 25 | |
| Stewart & Holihan | 2 48 | |
| John Scherb | 10 00 | |
| Funk & Wagnall Company | 25 20 | |
| New York and New Jersey Telephone Company | 58 67 | |
| James A. Smith | 18 70 | |
| Daniel J. Haggerty | 75 00 | |
| George W. DuBois | 549 00 | |
| Frank P. Tormey | 8 30 | |
| New York and New Jersey Telephone Company | 62 71 | |
| Outstanding Liabilities— | | |
| New York and New Jersey Telephone Company (estimated) | 65 00 | |
| John Scherb | 10 00 | |
| Police Department | 4 00 | |
| Daniel J. Haggerty | 75 00 | |

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| | | |
|---|---|---|
| Outstanding Liabilities— | | |
| Frank P. Tormey | 21 60 | |
| George W. DuBois | 1,403 00 | |
| Interborough Supply Company | 183 01 | |
| Collins' Staten Island and New York Express (estimated) | 50 00 | |
| William H. Sullivan (estimated) | 10 00 | |
| Excello Paint and Oil Company | 86 63 | |
| Total | | 9,689 72 |
| Estimated deficiency | | $2,189 72 |

Water Fund, Borough of Richmond.

| | | |
|---|---|---|
| Balance of fund January 1, 1908 | | $1,358,691 23 |
| Total amount of vouchers drawn against account for first quarter | $4,805 06 | |
| Total amount of vouchers drawn against account for second quarter | 5,032 23 | |
| Total amount of vouchers drawn against account for third quarter | 62,891 49 | |
| Vouchers Drawn Against Account Quarter Ending December 31, 1908— | | |
| In favor of: | | |
| Payroll, week ending October 7 | $120 00 | |
| Interborough Supply Company | 62 00 | |
| Payroll, week ending October 14 | 125 00 | |
| Payroll, week ending October 21 | 120 00 | |
| Payroll, month ending October 31 | 1,115 72 | |
| Payroll, week ending October 28 | 120 00 | |
| Technical Supply Company | 626 59 | |
| James H. Riches | 162 88 | |
| Payroll, week ending November 4 | 120 00 | |
| Payroll, week ending November 11 | 120 00 | |
| Daly & MacBean | 48,109 95 | |
| Payroll, week ending November 18 | 120 00 | |
| Payroll, month ending November 30 | 1,375 00 | |
| James H. Riches | 207 05 | |
| Payroll, week ending November 25 | 130 00 | |
| Payroll, week ending December 2 | 120 00 | |
| James H. Riches | 158 90 | |
| Daly & MacBean | 12,627 72 | |
| Payroll, week ending December 9 | 135 00 | |
| Payroll, week ending December 16 | 120 00 | |

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| | | |
|---|---|---|
| Vouchers Drawn Against Account Quarter Ending December 31, 1908— | | |
| In favor of: | | |
| Payroll, month ending December 31 | 1,375 00 | |
| U. T. Hungerford Brass and Copper Company | 54 51 | |
| Payroll, week ending December 23 | 130 00 | |
| Payroll, 8 days ending December 31 | 140 00 | |
| Total | | 140,224 10 |
| Estimated balance | | $1,218,467 13 |
| Credit account | | 175 84 |
| Total estimated balance | | $1,218,642 97 |

New Brighton, N. Y., January 15, 1909.

Hon. JOHN E. BOWE, Deputy Commissioner, Department of Water Supply, Gas and Electricity, Borough of Richmond, New York:

Dear Sir—The following is report of the Bureau of Chief Engineer, Borough of Richmond, for the year ending December 31, 1908.

Respectfully submitted,

J. W. McKAY, Acting Chief Engineer.

New Brighton, N. Y., January 6, 1909.

Mr. JOHN W. McKAY, Acting Chief Engineer, Department of Water Supply, Borough of Richmond, New York:

Dear Sir—I herewith submit a report of the work done, materials furnished, mains extended and repairs made to gates, pumps, hydrants, etc., during the year ending December 31, 1908:

Distribution System, Tottenville.

| | |
|---|---|
| New hydrants installed in place of old ones | 8 |
| Hydrants repaired | 44 |
| Gates repaired | 3 |
| Pipe laid (linear feet) | 1,192 |
| Leaks in mains repaired | 38 |
| Gate boxes raised to grade | 18 |
| New gates | 1 |
| Meters installed | 152 |
| Total meters | 740 |
| Taps | 150 |
| Total number of hydrants | 245 |

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Work Done by Contract on Morningstar Road, Oldstone Road, Amboy Road and Richmond Road.

| | |
|---|---|
| 20-inch mains laid, linear feet | 24,766 |
| 16-inch mains laid, lienar feet | 14,573 |
| 12-inch mains laid, linear feet | 337 |
| 8-inch mains laid, linear feet | 1,796 |
| 6-inch mains laid, linear feet | 180 |
| 6-inch valves set | 8 |
| Hydrants furnished and set | 12 |
| Rock excavated, cubic yards | 469 |
| Extra excavation, cubic yards | 332 |

The contract (called Contract No. 2) for furnishing, delivering and laying water mains and appurtenances in Morningstar, Richmond, Old Stone and Amboy roads is practically completed. Ground was broken on September 7, 1908, and the work progressed throughout. Few obstacles were met with, and the weather has been remarkably favorable. Two water pressure tests of 100 pounds to the square inch have been made so far, without causing any apparent leaks in the joints. Similar tests will be made on the rest of the line as soon as the hydrants and gates are in place.

During first six weeks of year shut-off gang were kept busy repairing and pumping out frozen hydrants; new leather washers were put in two hydrants.

One hydrant was disconnected and taken to Tottenville Pumping Station, where it was repaired and fitted with new valve gasket and washers were put back in place.

One new hydrant was connected to discharge main at the Tottenville Pumping Station for flushing out wells and for fire purposes. Stand pipe was cleaned, scraped and painted during year.

Respectfully,

JAS. H. RICHES, Assistant Engineer.

New Brighton, N. Y., January 6, 1909.

Mr. JOHN W. McKAY, Acting Chief Engineer, Department of Water Supply, Borough of Richmond, New York:

Dear Sir—The following is a report of the work done at the Tottenville Pumping Station during the year ending December 31, 1908.

Respectfully submitted,

F. P. TORMEY, Engineman in Charge of Pumping Stations.

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## TOTTENVILLE PUMPING STATION.

### Main Engines.

Engines Nos. 1 and 2—Made two fork ends for counters, connected one new combination gauge on suction, new drip pans were made and connected under engines, all packing was removed from the valve, steam and water rod boxes and same packed on four occasions during year; valves, springs and studs in water ends were overhauled and a number of new valves and springs were placed in same.

Engine No. 3—During the first quarter of the year a two-million gallon Worthington pumping engine was secured from the Brooklyn Department. This engine was old, and when delivered here it was dismantled and all working parts were scraped and cleaned, repairs were made where necessary and a number of small parts were renewed. Engine was then connected together again and left in good condition ready to start. Concrete foundation was built, and after completion pump was placed on same. Suction was laid between pump and receiving well.

### Air Compressor.

Compressor was secured during first quarter of the year, on a Departmental order, and before it was put in service it was thoroughly overhauled and repaired; all working parts were removed, scraped and cleaned; governor was taken apart, cleaned and seemed to run at the proper number of revolutions; main shaft was trued up and main bearing was scraped and fitted to shaft; all wedges in boxes were properly adjusted; air valves and springs were taken out, cleaned and faced and put back in place.

A temporary timber foundation was made and compressor set on same; after this work was accomplished, steam and water pipe connection was made; two lengths of 10-inch wrought iron pipe were connected together and used as an air receiver; necessary pipe connections were made between compressor and receiver, also two wells which are used in the air lift; a 3-inch pipe was laid between the compressor and new well, connections were left in same to blow out the other wells with air; a 6-inch C. I. pipe was laid from the air lift to receiving well.

### Wells and Well Pump.

Well No. 1—Valve gear on pump overhauled; new pins and brasses were put in where needed, also valves in water end; exhaust of engine connected to drain in ground; replaced main steam line with one length of pipe.

Well No. 2—Well house over pump well was moved back in order to have access to pump and make necessary repairs; steam end was disconnected and moved back, new pins were put in valve gear, repaired piston valves, removed valves, rods and pipe from well and flushed out same; after the work of repairing was accomplished on this well, I found that there was more water in this well than the single-acting pump could handle, and as No. 3 well had a double-acting pump connected on same,

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that was put out of service by the installation of the air lift, I had pump well No. 2 disconnected and removed to this well and connected on same.

Well No. 3—This well did not give satisfactory results for the reason that the well was not sunk deep enough; in addition to this, there was no strainer connected on same; I had the well sunk eleven feet deeper; this made a total of 104 feet; I fitted a cork strainer on same and connected same up to air compressor, and very good results have been obtained.

Well No. 5—Well did not give satisfactory results, and it became necessary to draw up same. This required the removal of the well house and steam end of pump. The hollow and solid plunger rods and valves were drawn out, as were the 7-inch pipe and working barrel; the leather in bottom of same was renewed, steam end and parts were put back in place, pump and engine were connected and house set over same. After running for a short time engine worked badly. Steam end was again disconnected and taken down, main bearings were rebabbited, scraped and fitted; main pins trued up to fit new bearings, all pins and valve gears overhauled and engine put back in service. The lower sucker valve also broke; this made it necessary to remove house, engine, rods, etc., again to get at the valve and repair same. All valves, fittings and pipes were renewed from steam cylinder of engine, drains were connected up to pipe in ground of station. A new steam and discharge pipe was connected on syphon, all old packing was removed on the steam and water end and same repacked.

Well No. 6—This well became plugged with sand, and as a result of same, leather cut very badly, so that it was necessary to draw out the rods, valves, pipe and working barrel. New leathers were fitted on valves, wells were flushed out for six hours, and the parts were put back in place. After pump was in operation for a month, the top valve in the water end broke; this required the same work to be accomplished over again, in order to make the necessary repairs. New steam and discharge lines were connected, and a new nozzle put in syphon. Thread in coupling that connects the hollow rods to the crosshead and the valves pulled out. The work of repairing same was accomplished after the engine and pump were disconnected and drawn out for the third time during the year. All old packing was removed from steam and water rod stuffing boxes, and same was repacked.

Well No. 7—This is one of the four 10-inch wells that was sunk at the time plant was extended, and never gave satisfactory results at quarter piston speed, so I abandoned the use of same. I would suggest that a new well be driven in the lower end of the property, and this pump be connected on same I believe if the sugestion is followed out, that the yield from this station would be increased about 250,000 gallons per day. Tool valve on this well broke, and rods, valves and pipe were drawn out so that necessary repairs could be made. After repairs were accomplished engine and pump were connected together again, and put in operation. A 6-inch check valve was connected on discharge pipe of this well, also on wells Nos. 5 and 6.

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Well No. 8—All old packing was removed from the steam and water end of this pump, and same was repacked. Well was flushed out.

During year one 8-inch well was sunk for the air lift; this well when tested gave a yield of 333 gallons per minute, and is evidence that with the air lift installed on all the wells, over 1,500,000 gallons can be pumped from this plant, without making further extension.

### Steam Piping.

Connected new steam line to steam turbine for cleaning tubes in B. and W. boilers.

Laid 125 feet of 6-inch pipe and connected same to main line.

Flushed out and repaired 420 feet of 8-inch drain pipe.

Connected new steam pipe to steam trap in No. 2 house. Connected new lubricator and new steam piping for same on feed pumps.

Repaired steam radiator in tool house and ran new steam pipe to same.

Covered 82 feet of 2-inch steam pipe with 85 per cent. magnesia covering; also 15 feet of 3-inch pipe.

### Gauges.

Repaired rain gauge.

Repaired damper regulator, by putting new capped washers in water cylinders and new gaskets in steam end.

### Forge Work.

Dressed and tempered flat round nose cape diamond point and cold chisels; made 10 scrapers to scrape fence and standpipe; made hose for drawing ash pans and cleaning fires. Removed bolts from old derrick, cut same and welded pieces to them to make them long enough for new derrick. Also made two knees for same.

Repaired chain sling; made hangers for 3-inch steam pipe.

### Boilers.

During year B. and W. boilers were thoroughly overhauled and cleaned. All caps were removed, tubes cleaned with turbine cleaner and scale removed from steam dome and mud drums.

Repaired grates, bearing bars and door fronts. Removed water columns, gauge cocks, gauge glass cocks and nipples connected on same. These fittings were all cleaned and connected in place again. Renewed check and gate valves on feed line.

New blow pipe was connected on this boiler and boiler front was painted.

Nos. 1 and 2 boilers were overhauled and cleaned, water columns and all gauge fittings were repaired and cleaned. Blow off piping was renewed with new blow off valves. A new cold water surface feed was connected up to this battery.

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Carpenter Work Accomplished.

All old planking and timbers were removed from platform scale and were renewed with new plank and timbers.

New house was built over No. 5 engine; put new sills under well house on No. 6 well. Made large tool house. Shut-off gang repaired fence around ground. Built one large tripod derrick for driving well for air lift system. Also built one small tripod derrick.

Made new pile driving derrick for engine to hoist out well pipe, valves, rods, etc., from deep well pump.

Renewed all planking on run to coal shed.

Built temporary shed over air compressor.

Painting Accomplished.

Worthington engine, air receiver, heaters in engine room and tool room were cleaned, scraped and painted; coal shed was also painted. All steam pipe covering was painted three coats.

Statement of Water Rents and Charges Collected and Deposited for the Year Ending December 31, 1908.

| | First Quarter. | Second Quarter. | Third Quarter. | Fourth Quarter. | Total. |
|---|---|---|---|---|---|
| Annual and frontage rates | ..... | $207 00 | $157 12 | $2 68 | $366 80 |
| Penalties on deferred bills and annual rates | ..... | ..... | 2 65 | ..... | 2 65 |
| Meter charges for water supplied in buildings | $148 40 | 1,760 84 | 531 87 | 2,232 18 | 4,673 29 |
| Charges for water supplied for building purposes | 31 50 | 31 48 | 23 52 | 59 38 | 145 88 |
| Meter charges for water supplied in shipping | ..... | ..... | ..... | ..... | ..... |
| Charges for water supplied for shipping, not metered | ..... | 5 00 | ..... | ..... | 5 00 |
| Charges for water supplied for street sprinkling | ..... | ..... | ..... | ..... | ..... |
| Charges for water supplied for miscellaneous purposes | ..... | ..... | ..... | ..... | ..... |
| Charges for permits to tap water | ..... | ..... | ..... | ..... | ..... |
| Total | $179 90 | $2,004 32 | $715 16 | $2,294 24 | $5,193 62 |

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Hon. JOHN H. O'BRIEN, Commissioner, Department of Water Supply, Gas and

Dear Sir—I herewith transmit the annual report, showing receipts for water rents

1908.

| Month. | Rates. | Penalty. |
|---|---|---|
| January | $4,532 90 | $511 70 |
| February | 3,604 95 | 417 70 |
| March | 4,080 70 | 474 90 |
| April | 5,252 80 | 556 55 |
| May | 81,019 41 | 429 55 |
| June | 85,729 30 | 773 80 |
| July | 244,351 55 | 791 35 |
| August | 26,390 50 | 928 65 |
| September | 14,388 95 | 697 11 |
| October | 30,043 75 | 1,424 60 |
| November | 9,735 20 | 1,189 30 |
| December | 9,309 90 | 1,238 80 |
| Total | ..... | ..... |
| For taps | ..... | ..... |
| For M. S. | ..... | ..... |
| Grand total | ..... | ..... |

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Department of Water Supply, Gas and Electricity, Bureau of Water Register,
Third Avenue and One Hundred and Seventy-seventh Street,
New York, January 4, 1909.

Electricity, Nos. 13 to 21 Park Row, New York City:

in the Borough of The Bronx for the year 1908, as follows:

| Meters. | B. P. | Extras. | Taps. | M. S. | Total. |
|---|---|---|---|---|---|
| $33,212 10 | $381 13 | $521 82 | $208 00 | ..... | $39,159 65 |
| 7,743 00 | 118 90 | 646 64 | 84 50 | ..... | 12,531 19 |
| 9,426 20 | 992 42 | 654 43 | 416 00 | $186 00 | 15,628 65 |
| 12,706 60 | 1,405 65 | 963 32 | 688 00 | 86 07 | 20,884 92 |
| 44,859 60 | 991 64 | 918 93 | 678 00 | 186 06 | 128,219 13 |
| 23,549 75 | 875 49 | 446 04 | 674 00 | 317 56 | 111,394 38 |
| 29,675 15 | 1,274 34 | 817 12 | 961 50 | 188 00 | 276,909 51 |
| 54,809 00 | 1,634 52 | 657 40 | 818 50 | 56 73 | 84,420 07 |
| 7,767 70 | 1,747 15 | 832 20 | 566 00 | ..... | 25,433 11 |
| 25,875 90 | 1,784 88 | 426 77 | 866 50 | 62 43 | 59,555 90 |
| 35,421 30 | 2,241 35 | 3,613 95 | 1,000 00 | ..... | 52,201 10 |
| 16,592 05 | 1,358 53 | 435 02 | 579 50 | 26 59 | 28,934 30 |
| ..... | ..... | ..... | $7,540 50 | $1,109 44 | $855,271 91 |
| ..... | ..... | ..... | ..... | ..... | 7,540 50 |
| ..... | ..... | ..... | ..... | ..... | 1,109 44 |
| ..... | ..... | ..... | ..... | ..... | $863,921 85 |

Respectfully submitted,

THOMAS M. LYNCH, Water Register, Borough of The Bronx.

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Department of Water Supply, Gas and Electricity,
Borough of Queens,
Long Island City, March 3, 1909.

Hon. JOHN H. O'BRIEN, Commissioner of Water Supply, Gas and Electricity, Nos. 13 to 21 Park Row, New York City:

Dear Sir—Enclosed please find statement of collections in this Borough during the year ending December 31, 1908, including the arrears returned to the Bureau of Assessments and Arrears on August 1. 1908. The report of the Bureau of Lamps and Lighting, as also the Bureau of Electrical Inspection, will, according to instructions of Mr. Lacombe, be sent to him. and I presume, incorporated in his report of the entire Department to you.

Yours very respectfully,

CHAS. C. WISSEL, Deputy Commissioner, Queens.

Statement of Collections During the Year Ending December 31, 1908.

| | |
|---|---|
| Regular and meter rates | $206,667 30 |
| Penalties on deferred payments of annual rates | 1,390 19 |
| Charges for water supplied for building purposes | 4,541 24 |
| Charges for water supplied for miscellaneous purposes | 554 95 |
| Charges for permits to tap mains | 3,137 25 |
| Charges for meter settings and repairs | 315 22 |
| Total receipts for the year | $216,606 15 |
| Arrears—Amount returned to Bureau of Arrears August 1, 1908 | 38,317 42 |
| Total revenue for the year | $254,923 57 |

Department of Water Supply, Gas and Electricity,
Office of Deputy Comptroller, Borough of Brooklyn,
Brooklyn, January 12, 1909.

Hon. JOHN H. O'BRIEN, Commissioner of Water Supply, Gas and Electricity:

Dear Sir—I beg to forward herewith detailed statement of the receipts of the Department in this Borough during the year ending December 31, 1908, together with a statement of the receipts for the year 1907, for comparison. I enclose also a statement of the meters set during the year, and of the meter accounts closed; also a statement of the receipts of the office and the amounts returned to the Department of Arrears as unpaid water rates from 1899 to date.

Yours truly,

WM. C. COZIER, Deputy Commissioner, Borough of Brooklyn.

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Department of Water Supply, Gas and Electricity,
Bureau of Water Rates, Borough of Brooklyn,
January 4, 1909.

Mr. WILLIAM C. COZIER, Deputy Commissioner:

Dear Sir—I have the honor to submit herewith a detailed statement of the receipts of this office for the year ending December 31, 1908, with a statement of the receipts for 1907 for comparison; a statement of the meters set during the year and of the meter accounts closed, and a statement of the receipts of the office and the amounts returned to the Department of Arrears as unpaid water rates, from 1899 to date.

In addition to the receipts of this office for water, the amounts collected for water of previous years by the Receiver of Taxes and the Collector of Arrears, amounted to $200,480.25, as follows:

| | |
|---|---|
| Receiver of Taxes | $106,615 60 |
| Collector of Arrears | 93,864 65 |
| Total | $200,480 25 |

These total the full amount of receipts for water during the year from all sources as $3,054,487.50, for this Borough.

Respectfully,

WM. R. McGUIRE, Water Registrar.

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| 1908. | Regular. | Meters. |
|---|---|---|
| January | $11,791 72 | $67,636 22 |
| February | 11,157 42 | 50,680 49 |
| March | 11,357 58 | 54,597 52 |
| April | 13,261 10 | 145,941 95 |
| May | 376,691 85 | 75,660 34 |
| June | 302,679 95 | 182,089 29 |
| July | 724,138 97 | 101,353 96 |
| August | 130,297 13 | 35,126 32 |
| September | 44,110 58 | 19,133 98 |
| October | 136,376 14 | 31,149 30 |
| November | 38,034 83 | 32,669 42 |
| December | 19,422 43 | 146,503 61 |
| Total | $1,819,319 70 | $942,542 40 |
| 1907 | 1,815,583 68 | 959,452 42 |
| Decrease | ..... | $16,910 02 |
| Increase | $3,736 02 | ..... |
| Net decrease | | |

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| Penalty. | Buildings. | Meter Settings. | Labor and Material. | Taps. | Total. |
|---|---|---|---|---|---|
| $1,332 95 | $707 80 | $309 36 | $61 37 | $832 18 | $82,671 60 |
| 1,280 90 | 505 85 | 669 35 | 74 36 | 273 00 | 64,641 37 |
| 1,422 54 | 2,842 35 | 236 41 | 26 72 | 730 50 | 71,213 62 |
| 1,627 21 | 3,907 40 | 139 11 | 7 98 | 1,876 85 | 166,761 60 |
| 1,903 04 | 3,007 20 | 296 24 | 739 27 | 1,437 00 | 459,734 94 |
| 1,982 22 | 2,440 40 | 370 98 | 94 60 | 1,683 00 | 491,340 44 |
| 2,481 30 | 2,812 60 | 661 59 | 3,069 75 | 1,481 50 | 835,999 67 |
| 3,228 80 | 3,676 20 | 121 63 | 332 23 | 912 50 | 173,694 81 |
| 2,124 35 | 4,222 65 | 175 74 | 238 03 | 1,488 48 | 71,493 81 |
| 6,713 75 | 4,846 85 | 245 07 | ..... | 1,842 50 | 181,173 61 |
| 3,936 70 | 4,460 25 | 438 19 | 244 66 | 1,851 25 | 81,635 30 |
| 2,681 68 | 3,303 00 | 250 42 | 89 59 | 1,395 75 | 173,646 48 |
| $30,715 44 | $36,732 55 | $3,914 09 | $4,978 56 | $15,804 51 | $2,854,007 25 |
| 26,023 72 | 58,805 00 | 7,335 58 | 5,716 02 | 21,373 55 | 2,894,289 97 |
| ..... | $22,072 45 | $3,421 49 | $737 46 | $5,569 04 | $48,710 46 |
| $4,691 72 | ..... | ..... | ..... | ..... | 8,427 74 |
| ..... | | | | | $40,282 72 |

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## Statement of Meters Set and Accounts Closed During 1908.

| | ⅝-inch. | ¾-inch. | 1-inch. | 1½-inch. | 2-inch. | 3-inch. | 4-inch. | 6-inch. | 8-inch. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|
| **New Accounts Set by Consumers.** | | | | | | | | | | |
| Worthington | 85 | 6 | 18 | 23 | 38 | 12 | 4 | 2 | .. | **188** |
| Thomson | 581 | 48 | 43 | 22 | 34 | 12 | 1 | 3 | .. | **744** |
| Trident | 140 | 10 | 10 | 7 | 11 | 2 | 1 | 5 | 3 | **188** |
| Standard | 80 | 5 | 6 | 11 | 17 | 2 | 2 | 2 | 1 | **126** |
| Crown | 17 | 2 | 2 | 1 | 1 | .. | 1 | .. | .. | **24** |
| Nash | 5 | 1 | .. | .. | .. | .. | .. | .. | .. | **6** |
| Hersey | 1 | .. | .. | .. | .. | .. | 1 | 6 | .. | **8** |
| Total | 909 | 72 | 79 | 64 | 101 | 28 | 10 | 18 | 3 | **1,284** |
| **New Accounts Set by Department Plumber.** | | | | | | | | | | |
| Worthington | 68 | 3 | 1 | .. | .. | .. | .. | .. | .. | **72** |
| Thomson | 42 | 4 | 3 | 1 | .. | .. | .. | .. | .. | **50** |
| Trident | 74 | .. | .. | 3 | .. | .. | .. | .. | .. | **77** |
| Hersey | .. | 6 | .. | .. | .. | .. | .. | .. | .. | **6** |
| Total | 184 | 13 | 4 | 4 | .. | .. | .. | .. | .. | **205** |
| Total new accounts | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1,489** |
| **Meters Set in Place of Meters Removed.** | | | | | | | | | | |
| Worthington | 15 | 1 | 6 | 1 | 8 | 4 | 3 | 2 | .. | **40** |
| Thomson | 35 | 3 | 18 | 5 | 4 | 3 | .. | 1 | .. | **69** |
| Trident | 3 | 2 | 5 | 2 | 2 | .. | .. | .. | .. | **14** |
| Standard | 6 | .. | 4 | 5 | 4 | .. | 1 | .. | .. | **20** |
| Crown | .. | 3 | .. | 1 | 1 | .. | .. | .. | .. | **5** |
| Nash | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | **4** |
| Keystone | .. | .. | 1 | .. | .. | .. | .. | .. | .. | **1** |
| Total | 61 | 10 | 35 | 14 | 19 | 7 | 4 | 3 | .. | **153** |
| Total meters set | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1,642** |

Accounts Closed—Buildings removed, taps drawn, or buildings used for residence purposes only, 72.

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Statement of Receipts for Water Rates, and of the Amounts Returned to Arrears as Unpaid Rates of the Previous Year, from 1899 to 1908.

| Year. | Receipts. | Arrears. |
|---|---|---|
| 1899 | $1,913,088 19 | $228,572 89 |
| 1900 | 1,926,294 35 | 197,199 33 |
| 1901 | 2,448,402 12 | 213,838 07 |
| 1902 | 2,418,352 88 | 229,103 35 |
| 1903 | 2,477,703 81 | 158,644 84 |
| 1904 | 2,462,483 87 | 194,340 59 |
| 1905 | 2,725,444 09 | 730,508 71 |
| 1906 | 2,942,102 82 | 171,397 76 |
| 1907 | 2,894,289 97 | 151,915 60 |
| 1908 | 2,854,007 25 | 300,321 55 |

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## Report of Operations During the Year 1908.

| | Poles and Overhead Wires. | Underground Construction. | Interior Wiring. | Total. |
|---|---|---|---|---|
| Applications brought forward | 27 | 51 | 78 | 156 |
| Applications received | 8,582 | 3,751 | 12,118 | 24,451 |
| Applications refused or pending | 115 | 34 | 1,868 | 2,017 |
| Permits or certificates granted | 8,494 | 3,768 | *10,328 | 22,590 |

* Certificates.

| Companies. | Distribution and Classification of Permits. | |
|---|---|---|
| | Poles and Overhead Wires. | Underground Construction. |
| Brooklyn Borough Gas Company | ..... | 203 |
| Brooklyn Heights Railroad Company | 145 | 5 |
| Brooklyn Union Gas Company | ..... | 1,114 |
| Coney Island and Brooklyn Railroad Company | 31 | 8 |
| Department of Education | ..... | 10 |
| Edison Electric Illuminating Company | 1,929 | 1,200 |
| Fire Department | 11 | 6 |
| Flatbush Gas Company | 241 | 504 |
| Kings County Lighting Company | ..... | 362 |
| Kings County Refrigerating Company | ..... | 3 |
| New York and New Jersey Telephone Company | 6,112 | 348 |
| Postal Telegraph and Cable Company | 4 | ..... |
| Stock Quotation Telegraph Company | ..... | ..... |
| Western Union Telegraph Company | 19 | ..... |
| Kirkman's Sons | ..... | 1 |
| H. C. Will | 1 | ..... |
| Police Department | ..... | ..... |
| Eberhard-Faber Pencil Company | ..... | 1 |
| John Pirkl Iron Works | ..... | 1 |
| Bush Terminal Company | 1 | ..... |
| Total | 8,494 | 3,766 |

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| Operations. | | | | | | |
|---|---|---|---|---|---|---|
| Poles Erected. | Poles Removed. | Overhead Wires Removed. | Subway Constructed. | Subway Duct Laid. | Conductors Placed in Subways. | Gas Main Laid. |
| | | Miles. | Miles. | Miles. | Miles. | Miles. |
| ..... | ..... | ..... | ..... | ..... | ..... | 2.31 |
| 467 | 497 | 33.18 | .793 | 6.164 | 3.59 | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | 12.62 |
| 6 | ..... | 5.30 | 4.8047 | 19.3594 | 20.03755 | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 937 | 510 | 57.88 | (..... | 13.95) | 58.76 | ..... |
| 6 | 47 | 12.836 | ..... | .012 | 1.39 | ..... |
| 203 | 173 | 8.04 | .40 | 1.20 | 4.94 | 3.19 |
| ..... | ..... | ..... | ..... | ..... | ..... | 4.15 |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 734 | 143 | 1,035.50 | 7.83 | 65.72 | 26,162.15 | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | 3.00 | ..... | ..... | ..... | ..... |
| 9 | 7 | 1.50 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | 9 | 7.88 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 2,362 | 1,386 | 1,165.116 | 13.8277 | 106.4054 | 26,250.86755 | 22.27 |

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Appliances Inspected.

| | |
|---|---|
| Incandescent lamps | 387,086 |
| Arc lamps | 2,777 |
| Motors (horse power, 17,872.50) | 2,580 |
| Generators (kilowatts, 12,790.25) | 74 |
| Electric signs (incandescent lamps, 30,367) | 431 |
| Services | 1,271 |
| Picture machines | 296 |
| Inspections interior wiring | 32,134 |
| Complaint notices issued | 1,745 |

E. W. LATHAM, Chief Inspector.

BOROUGH OF BROOKLYN.

Department of Water Supply, Gas and Electricity, Borough of Brooklyn,
Chief Engineer's Office, Room 25, Municipal Building,
Brooklyn, N. Y., January 15, 1909.

Hon. WILLIAM C. COZIER, Deputy Commissioner of Water Supply, Gas and Electricity:

Dear Sir—I beg to submit the following report showing the condition of the water supply in the Borough of Brooklyn, and the work done in connection with the same for the year ending December 31, 1908; also I attach herewith a statement of the receipts and expenditures for the year 1908:

Financial.

| | | |
|---|---|---|
| Receipts— | | |
| Regular water rates | $1,819,319 70 | |
| Metered water rates | 942,542 40 | |
| Penalties, arrears, etc | 287,705 41 | |
| Total collections by Water Registrar, to credit of Water Revenue, Borough of Brooklyn | | $3,049,567 51 |
| Setting Meters (credited to Water Meter Fund) | | 3,914 09 |
| Total receipts | | $3,053,481 60 |

Expenditures.

| | |
|---|---|
| Water Revenue Accounts— | |
| Administration: | |
| Office of Deputy Commissioner (Supplies and Accounts), Salaries and Wages | $10,952 04 |
| Office of Chief Engineer, Salaries and Wages | 23,414 78 |

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| | | |
|---|---|---|
| Water Revenue Accounts— | | |
| Distribution: | | |
| Water Registration, etc., Salaries and Wages (Inspectors) | | 24,991 00 |
| Maintenance, Salaries and Wages | | 337,968 76 |
| Maintenance, Pipes, Hydrants, etc | | 13,153 93 |
| Maintenance and Distribution of Water Supply: | | |
| Fire Hydrant Rentals | | 113,382 01 |
| Supplies and Contingencies | | 528,326 77 |
| General Administration, Taxes | | 19,657 05 |
| Collection and Storage: | | |
| Pumping Stations, Salaries and Wages | | 614,084 11 |
| Pumping Stations, Repairs and Renewals | | 30,747 68 |
| Watersheds, etc., Salaries and Wages | | 129,441 75 |
| Watersheds, etc., Repairs and Renewals | | 930 57 |
| Total, Water Revenue Accounts | | $1,847,050 45 |
| Appropriation Accounts— | | |
| Administration: | | |
| Office of Deputy Commissioner, Salaries and Wages | | $12,250 00 |
| Distribution: | | |
| Water Registration, etc., Salaries and Wages | | 55,640 99 |
| Water Registration, etc., Supplies and Contingencies | | 667 07 |
| High Pressure Fire Service, Salaries and Wages | | 34,284 01 |
| High Pressure Fire Service, Supplies and Contingencies | | 5,791 68 |
| Fire Hydrant Rentals | | 20,415 00 |
| Total, Appropriation Accounts | | $129,048 75 |
| Corporate Stock Accounts— | | |
| Construction and Establishment of High Pressure Fire Service: | | |
| Salaries | $11,845 29 | |
| Contracts and Sundries | 185,594 14 | |
| Total | | $197,439 43 |
| Water Fund, Brooklyn: | | |
| Salaries | $153,102 33 | |
| Contracts and Sundries | 1,973,841 55 | |
| Total | | 2,126,943 88 |

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| | |
|---|---|
| Corporate Stock Accounts— | |
| Land for Additional Pipe Conduits and Works to Develop Underground Supply: | |
| Contracts and Requisitions | 3,967 60 |
| New High Pressure Pumping Station for the Massapequa Gallery: | |
| Contracts | 12,500 00 |
| Tower Service Pumping Engine at Mount Prospect Pumping Station: | |
| Contracts and Requisitions | 7,457 40 |
| Additional Hydrants: | |
| Contracts and Requisitions | 30,000 00 |
| Water Main from Trotting Course Lane to Myrtle and Cypress Avenues: | |
| Contracts | 68,688 04 |
| High Pressure Service, Coney Island System: | |
| Contracts | 68,379 25 |
| Total, Corporate Stock Accounts | $2,515,375 60 |
| Special Accounts— | |
| Water Meter Fund | $18,703 54 |

Summary of Expenditures.

| | |
|---|---|
| Appropriation Accounts | $129,048 75 |
| Water Revenue Accounts | 1,847,050 45 |
| Corporate Stock Accounts | 2,515,375 60 |
| Special Accounts | 18,703 54 |
| Total expenditures | $4,510,178 34 |

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Water Consumption, U. S. Gallons.

All Supplies.

| | 1907. | 1908. |
|---|---|---|
| Average daily consumption | 135,612,534 | 140,623,705 |
| Maximum daily consumption, winter months | 149,762,000 (Feb. 6) | 161,320,000 (Feb. 4) |
| Maximum daily consumption, summer months | 149,034,000 (June 4) | 160,605,000 (July 16) |
| Maximum average daily consumption for one month | 139,757,964 (Feb.) | 148,751,000 (Feb.) |
| Maximum daily consumption for year | 151,457,000 (Sept. 3) | 161,320,000 (Feb. 4) |
| Population dependent upon the systems | 1,392,000 | 1,436,000 |
| Average daily consumption, per capita | 97.4 | 97.9 |

In the above table and in statements hereinafter made on the condition of the supply, the item of "Consumption" includes not only the actual amount of water used by consumers but also waste and any errors of measurement.

Storage.

| Reservoir. | January 1, 1908. | | January 1, 1909. | |
|---|---|---|---|---|
| | Depth, Feet. | Contents, U. S. Gallons. | Depth, Feet. | Contents, U. S. Gallons. |
| Ridgewood Basin, No. 1 | 19.93 | 70,539,000 | 18.82 | 66,296,000 |
| Ridgewood Basin, No. 2 | 19.80 | 81,442,000 | 18.83 | 77,133,000 |
| Ridgewood Basin, No. 3 | 18.56 | 137,991,000 | 17.37 | 128,627,000 |
| Mount Prospect | 19.90 | 19,073,000 | 18.52 | 17,552,000 |
| Total (City) | | 309,045,000 | | 289,608,000 |
| Hempstead | 17.62 | 736,910,000 | 12.87 | 411,903,000 |
| Total storage | | 1,045,955,000 | | 701,511,000 |

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Rainfall, Inches.

| Year. | Brooklyn. | Hempstead. |
|---|---|---|
| 1902 | 48.47 | 51.98 |
| 1903 | 52.49 | 52.14 |
| 1904 | 44.41 | 48.62 |
| 1905 | 42.42 | 36.82 |
| 1906 | 44.79 | 44.12 |
| 1907 | 47.38 | 49.23 |
| 1908 | 39.34 | 34.44 |

The year 1908 was an unusually dry year; not only was the rainfall on the watershed far below the average—about 10 inches less than the average—but it was the lowest recorded for any one year since 1864.

This low rainfall cannot be said to have been entirely unexpected, in view of the previous long period of years in which the precipitation was in excess of the average, and neither would it be surprising if last year be but the first of a series of years of drought.

General Condition of the Supply.

The high rainfall of the last six months of 1907 and of the first five months of 1908—the latter was more than half the total for the whole year—not only enabled us to maintain the contents of the Hempstead Storage Reservoir about normal until June, but also added to the underground water storage, so that when the period of drought set in, we were enabled to draw from both sources sufficiently to meet the demand. The extent to which the Hempstead Storage Reservoir was drawn upon is shown by the fact that its contents decreased from 844,232,000 gallons on June 1 to 404,097,000 gallons on December 31, a loss of 440,135,000 gallons for the seven months, or at the rate of over 2,000,000 gallons per day. The increased extent to which we were required to draw upon the underground water storage is shown by the fact that the average daily yield from underground sources increased from 48,829,000 gallons during the first six months to 93,996,000 gallons during the last six months, an average gain of 45,167,000 gallons per day. The increased percentage of water utilized from the watersheds during the last half of the year is also shown by the marked decrease in the amount of waste from the supply ponds after May, there being no waste at all from them during the last four months.

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The following table gives a summary of the waste from the various ponds during 1908:

| Month. | Waste from Old Watershed, Gallons. | Waste from New Watershed, Gallons. | Total Gallons. |
|---|---|---|---|
| January | 254,883,800 | 5,425,900 | 260,309,700 |
| February | 587,779,700 | 118,033,600 | 705,813,300 |
| March | 501,407,600 | 3,581,200 | 504,988,800 |
| April | 210,681,200 | 136,322,800 | 347,004,000 |
| May | 109,824,600 | 119,491,400 | 229,316,000 |
| June | 20,369,800 | 16,098,300 | 36,468,100 |
| July | 3,268,300 | ..... | 3,268,300 |
| August | 2,771,300 | ..... | ..... |
| September | ..... | ..... | ..... |
| October | ..... | ..... | ..... |
| November | ..... | ..... | ..... |
| December | ..... | ..... | ..... |
| Total | 1,690.986,300 | 398,953,200 | 2,089,939,500 |

The work of developing the supply from underground sources was continued vigorously during the year. One temporary station, that at Lynbrook, was completed and put in operation, and good progress was made upon the installation of a second station at Rockville Centre. The latter will, probably, be started early next year. A great deal of work was done by the Department driven-well gangs at various stations, resulting in an increased yield from them, specially at Oconee, Forest Stream and Clear Stream. The work on the contracts for driving deep and shallow wells was completed during the year, and the wells were connected up and put in service. Contracts were let for the erection of three new pumping stations near Smiths Pond, Clear Stream and Valley Stream, and work on same has already been started. A contract was also awarded for driving the wells and laying the suction mains at the Canarsie and Gravesend Pumping Stations; work on this contract has also been commenced.

During the year the first of the two stations to be established by Mr. Titus within the Borough limits was put in operation. Pumping from this plant, located at Sixth street, between Third and Fourth avenues was started on January 11, and has been continued without interruption throughout the year. The amount obtained from this station steadily increased, from an average daily of 1,700,000 in January to an average daily of 5,100,000 gallons in December. Good progress was made by Mr. Titus upon the installation of his second plant, located at Trotting Course lane. It is expected that this plant will be put in operation early next year.

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At the present time the Borough of Brooklyn obtains its entire supply of water from the counties of Kings, Queens, Nassau and Suffolk, the bulk of it being obtained from Queens and Nassau, from water sheds extending from Spring Creek to Massapequa, inclusive, embracing a catchment area (from contour approximate zero to the ground water summit), of approximately 167 square miles.

The average annual precipitation on this water shed is about 44 inches, 45 per cent. of which may be considered as all that it is safe to assume as available yield.

The average annual supply, therefore, obtainable from the above catchment area would be 57,437,576,361 U. S. gallons, or 157,363,223 U. S. gallons per day.

Within the Borough limits of the County of Kings the greatest possible daily supply that can be obtained from our present plants and from those contemplated may be placed at approximately fifty (50) million U. S. gallons per day.

Assuming therefore that the average precipitation will continue to be 44 inches, the total daily average supply obtainable for the Borough of Brooklyn from all its present sources is approximately 207 million U. S. gallons.

The total consumption in the Borough, including the Twenty-ninth and Thirty-second Wards, for the year 1908, was 56,080,995,130 U. S. gallons, or an average daily consumption of 153,646,562 U. S. gallons, which represents only 74 per cent. of the possible average yield. It is evident, therefore, that the present sources can, and should be, further developed.

With their complete development, and with future annual rainfalls equal to the average of 44 inches, by the year 1915 we will have reached the limit of our present sources.

By checking the great waste that is now going on in the Borough, in addition to entirely developing the present sources, the time when the limit will have been reached will be extended considerably beyond the year 1915.

Should we have succeeding dry years, however, in which the rainfall would be considerably less than the average, the supply will prove inadequate long before that time.

I recommend, in view of the possibility of several years of low rainfall following the series of years just past in which the rainfall was above the average, that the proposed new sources of supply for Brooklyn be obtained without delay.

Equally as important at this time as taking measures to obtain new sources of supply and to fully develop our present sources, is the necessity of stopping the waste now going on in the Borough. From premises having leaky plumbing fixtures this waste alone approximates 15 per cent. of what is recorded as daily consumption, and if stopped, would reflect a very material saving to our supply. No more effective means of checking house waste is known than to install meters, and at the present time the number in use in the Borough is only 13,000.

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I recommend that meters be installed in all premises where the Department is authorized by law to order them installed, and where the law does not require their being ordered in by the Department, that a sufficient house to house inspection be maintained, and that the power vested in the Commissioner of Water Supply, Gas and Electricity be rigidly enforced to stop all leakage and wastage found.

Brooklyn's system of supply to-day is a most costly one from the standpoint of maintenance and operation. During the dry season as much as 85 per cent. of the supply is obtained from subsurface sources, from which it is pumped into the conduits, at plants, many of which are of a very crude nature and all of them have highly uneconomical pumping equipment.

In addition to the uneconomical means by which the water is pumped into the conduits before reaching the consumers, it has to be pumped two and three times the supply for the upper high service four times.

These conditions were allowed to exist entirely too long, and it was only about three years ago that the first actual start was made to carry out a scheme which, when completed, as at present planned and financed on similar lines, with provision for additional storage facilities, will give Brooklyn water at a cost that will far surpass the present one, in that it will reduce the cost of pumping the supply to a minimum.

The construction work now under way for the remodelling of the pumping plants should be pushed more rapidly to completion, and the forms of contracts that were submitted for approval and printing for the Wantagh and Massapequa pumping plants should be acted upon without further delay, as these two plants form an important part of the general scheme as planned. Also additional funds should be provided at once for the continuance of the work of remodelling and developing the plants, and the work should be continued as soon as possible after the funds are provided.

## Quality of the Supply

A comparison of the figures obtained from the analyses of samples collected from the Ridgewood Reservoirs and from various taps throughout the borough, shows that the general sanitary conditions of the water in 1908 was as satisfactory as in the previous year. Owing to the further increase in the percentage of water obtained from deep wells during the year, the color was reduced in the tap-samples from 3 to 2, and there was a corresponding reduction in the albuminoid and free ammonia. The increase in well water raised the amount of mineral matter in the water as shown by the increase in the total solids, from 86 to 91, in the chlorine from 9.3 to 10.3, and the hardness, from 32 to 34. The analyses also show a total absence of sewage fungus growths in the water, and practical freedom from nitrites (which are produced by these organisms) was maintained during the year.

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The accompanying chart (Diagram No. 2) gives the daily analyses of tap samples, the rainfall and the number of cases of typhoid fever by weeks during the year, as recorded by the Department of Health. The chart shows the usual fluctuations in turbidity, color and bacteria in the water. It also shows an unusually low curve for microscopic organisms. The results recorded of the presence of bacillus coli are shown to correspond with the rainfall. A study of the tests for bacillus coli in the individual surface supplies shows the same relationship, and indicates that it does not come from any single source of supply, but occurs in each of the streams and ponds after rains, and is caused by the surface wash. The chart shows an unusually low typhoid rate throughout the year.

Supply—Extension and Improvement.

Driven Wells—Work Under Contract—The work done under contract during the year on the extension and improvement of the driven well systems was as follows:

Contract for developing the deep wells at Jameco Pumping Station. Silas W. Titus, contractor; dated March 28, 1906.

During the year the contractor continued to pump from 15 of the 21 deep wells. The total pumped during the year was 2,198,579,587, or an average daily of 6,007,048 gallons.

On October 6, 1908, the Commissioner notified Mr. Titus to connect the remaining 6 deep wells, together with the 4 shallow "Lockwood" wells at the station without delay, and to operate same with his air lift system, using the City's Davidson pump to lift the water into the conduit. By mutual agreement, the contractor is to receive no payment for the yield he will obtain from the shallow wells, except an allowance for the coal consumed in pumping this water; provision is also made for the proper analyses of the water from both the shallow and deep wells.

Upon the completion of this work, the two-year extension of the contract is to commence, the rate of payment during this renewal period being $30 per million gallons, instead of the $40 per million gallons now being paid to the contractor, it being stipulated in the original contract that in case the two-year extension was granted, this reduction in price should take place.

The permanent equipment of the contractor at this station now consists of two 250 horsepower water tube boilers, 1 compressed steam duplex air compressor, 14 inches by 24 inches by 18 inches by 16 inches and 1 compressor, 15 inches by 28 inches by 22 inches by 24 inches, with condensers, feed pumps and feed water heater; this machinery is housed in a frame building adjoining the City's pumping station. A 16-inch by 18-inch compressor, of 500 cubic feet per minute capacity, is now being installed by the contractor for operating the shallow wells.

Contract for two pumping plants within City limits. Silas W. Titus, contractor, dated July 15, 1907.

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At the Sixth Street Plant, the contractor has driven 20 wells, located as follows:

Two on property bought by the contractor on the north side of Sixth street, between Third and Fourth avenues.

Three on south side of Fifth street, east of Fourth avenue.

Three on north side of Sixth street, east of Fourth avenue.

Three on north side of Sixth street, west of Fourth avenue.

Three on south side of Seventh street, east of Fourth avenue.

Three on north side of Eighth street, east of Fourth avenue.

Three on west side of Fourth avenue, between Fifth and Seventh streets.

These wells are pumped by the air-lift system, the water flowing by gravity from the wells to a receiving basin alongside the pumping station, whence the water is pumped by plunger pumps into the distribution system. The most remote well is about 1,300 feet from the pumping station. While the permanent station was being erected, the contractor used a temporary plant for pumping, which plant was abandoned when the permanent station was put in service at the end of August.

The contractor started pumping from the two wells in his property on January 11, 1908, at 2.50 p. m. Since that date 11 additional wells have been added, so that at the end of the year, the contractor was pumping from 13 wells. Of the 7 remaining wells, 4 are connected up and ready for pumping and 2 are ready for connecting up to the delivery pipes from the wells to the receiving basin.

The amount of water pumped at this station during the year, was as follows:

| | Total Pumped, U. S. Gallons. | Average Per Day. U. S. Gallons. |
|---|---|---|
| January | 27,566,940 | 1,378,347 |
| February | 48,806,230 | 1,682,973 |
| March | 61,751,440 | 1,991,982 |
| April | 68,198,462 | 2,273,282 |
| May | 71,210,050 | 2,297,099 |
| June | 70,802,010 | 2,360,067 |
| July | 73,457,300 | 2,369,590 |
| August | 71,168,640 | 2,295,763 |
| September | 101,655,542 | 3,388,515 |
| October | 144,051,353 | 4,646,818 |
| November | 151,008,274 | 5,033,609 |
| December | 157,871,424 | 5,092,627 |
| Total | 1,047,547,665 | 2,950,839 |

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Weekly analyses are made of samples of the water to determine the chlorine, iron and bacteria in same. Once a month, full chemical and bacteriological analyses are made. The average results of these analyses during the year were as follows:

| | Average Chlorine Parts Per Million. | Average Iron Parts Per Million. | Average Hardness. |
|---|---|---|---|
| First quarter | 7.5 | 0.14 | 123 |
| Second quarter | 12.1 | 0.13 | 135 |
| Third quarter | 16.8 | 0.14 | 155 |
| Fourth quarter | 19.3 | 0.15 | 167 |

Work was started on the construction of the permanent station on March 12, 1908. The building is 50 feet by 150 feet, and consists of a steel skeleton frame, with reinforced concrete, slate covered roof, and double cement walls with air spaces between them laid on reinforced metal lath. It is all completed except the finishing coat to the walls, the roof slate covering and painting. The radial brick stack and the receiving basin have been completed. The station is equipped with two 5,000,000 gallon horizontal triple expansion Worthington pumps (these to be replaced later by high duty pumping engines), two compressors of 2,500 cubic feet per minute capacity, two 353 horsepower Babcock & Wilcox, water tube boilers, two Blake air pumps, two boiler feed pumps, condensers and feed water heater. Space has been reserved in the station for additional units so that the terms of the contract as to reserve equipment can be complied with, when the total yield of the plant shall have been determined. A 20-inch Gem meter is used to measure the delivery from this station; this meter was tested before its installation, and is also tested at regular intervals.

At the Forest Park plant, the steel work for a station buiding, 50 feet by 150 feet, in size, has been erected. two 376 horsepower Babcock & Wilcox water tube boilers, with their settings, have been installed; two 5,000,000 gallon horizontal triple expansion Worthington pumps, two compressors (2,700 cubic feet per minute capacity), two air pumps, two condensers and a feed water heater have been set on their foundations, within the station, and almost completely connected up. The brick stack has been finished, as well as the large receiving basin into which the wells, pumped by the air lift system, discharge their yield. Twenty-seven wells have been driven by the contractor at this station to an average depth of about 215 feet; they consist of an 8-inch casing driven to a depth of 200 feet; then 6-inch pipe with slotted iron strainer at the lower end, plugged at the bottom and the space between the 6-inch and 8-inch pipe sealed, the 6-inch pipe extending to the surface. At a depth of 200 feet below the surface, there was found a red clay stratum with the material underneath varying from fine white sand mixed with fine gravel at some wells, to coarse sand at others. Some of the wells have additional strainers at points above,

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so that the yield may be obtained from different levels, although mostly from the deepest.

The first analysis of the water from the deep level showed that it contained 1.70 parts of iron per million, but after 52 hours of pumping it was reduced to 0.80 part per million; this iron is most likely due to the presence of clay, and after pumping will probably be reduced to the proportion allowed by the contract, viz., 0.25 part per million. The hardness was 102 and the chlorine 6.6 parts per million. The water from a depth of 136 feet below the surface proved to contain 0.05 part of iron per million. The normal water table is about 50 feet below the surface of the ground. The wells are scattered along the streets adjoining the station, the furthest well being about one-third of a mile from it. All the water and air pipes in these streets leading from the wells to the receiving basin have been laid; nineteen of the wells have been connected with the water mains and all of the permanent air piping, up to the chamber, which is to be placed around each well head, is installed. The temporary air pipes are still in place and each well has been provided with a temporary overflow, so that it can be pumped and thoroughly cleaned before final connection.

The yield from this plant will be delivered through a 30-inch force main running from the station along Trotting Course lane and Myrtle avenue to Cypress avenue, where it connects to the 48-inch main in that avenue. Under the terms of the contract, this main is to be laid by the City. A contract has already been awarded for the laying of this main and work on same has been started.

It is proposed to measure the quantity of water delivered by the contractor by means of a 20-inch Venturi meter provided with a registering device and a mercury manometer.

Contract for furnishing and driving or sinking deep wells, Grant Rohrer, contractor, dated May 21, 1907:

At Springfield Pumping Station 225 feet were driven during the first quarter of the year, thus completing eleven wells at this station, with a total depth of 2,155 feet, or 196 feet per well, all being about the same depth. At Baiseleys, 796 feet were driven, which completed sixteen wells, with a total depth of 3,509 feet, or an average depth of 219 feet. At Oconee, 844 feet were driven, completing fifteen wells at this station, with a total depth of 3,123 feet, each well being about 208 feet deep. All these wells were pumped clear and tested, all showing uniformly good results. The work on this contract was entirely completed on May 30, 1908, and the final estimate for same forwarded for payment. The total amount of work done under the contract was $43,513.94.

Contract for furnishing and driving shallow wells, P. H. & J. Conlan, contractors, dated May 31, 1907:

At St. Albans, 481 feet were sunk, completing eight wells there, with a total depth of 627 feet, or an average of 78 feet to the well. At Rockville Centre, 2,001

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feet were sunk during the first quarter and three wells were completed during the second quarter, making twenty-five wells for this station. All of these wells were pumped until cleared, some of them showing much better results than others. The work on this contract was completed on April 16, 1908, and the final estimate prepared and forwarded for payment. The total amount of work done was $35,229.17.

Contract for sinking shallow wells and laying suction mains at the Canarsie and Gravesend Pumping Stations:

The original contractors for this work, Isaac Harris Company, refused to complete their contract. They were finally notified that their contract had been declared abandoned. The contract was readvertised and bids were received on October 28, 1908. The lowest bidders were the Phoenix Construction Company, the amount of their bid being $34,301.80. The contract was awarded to them and they were directed to begin work on December 31, 1908.

Contract for delivering water, Queens County Water Company, contractors, dated August 22, 1903:

The company delivered, without interruption, during the year 3,000,000 gallons of water daily, called for by the contract. This water is delivered into the conduit near the Watts Pond Pumping Station and is measured by a 20-inch "Gem" meter, which is tested periodically with a weir. During the year six tests were made of the meter. Analyses of 99 samples of the water supplied by the company show an average of 1.9 parts per million of iron for the year.

Driven Wells—Work Done by Department Men.

New Utrecht Station—Two deep wells were sunk at this station as an experiment. The clay bed was reached at approximately 100 feet and at a depth of 165 feet a layer of large sized gravel was encountered, which, with the means at command, it has not been possible to penetrate. A Johnson strainer was inserted on each well and they were pumped clear. A yield of about 500,000 gallons per day was obtained from one of the wells, but the water, when analyzed, showed 3,000 parts of chlorine per million.

Gravesend Station—At this station six new 6-inch shallow wells, with Johnson strainers, were driven to a depth of about 60 feet. A new suction main was laid and the new wells were connected up. These new wells, it is expected, will increase the yield from this station by about 2,000,000 gallons per day.

Ridgewood Station—Seven 6-inch test wells were sunk at the site of the proposed new pumping station, to determine the stratification at the site. These test wells have an average depth of 27 feet. At the South Side Station a well was driven to a depth of 100 feet. Good water bearing material was encountered here.

Baiseleys Station—The suction main at this station was lengthened at both ends and the sixteen wells driven here by the contractors were connected up. The yield

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from this station is unsatisfactory. The new wells will have to be cleaned out before any good results can be obtained from them.

St. Albans Station—Three of the shallow wells at this station were cleaned out and the wells driven by the contractors were connected up to the system and put in service.

Springfield Station—The five deep wells driven at this station by the contractors were connected up.

Clear Stream Station—Ten deep wells were driven at this station. At a depth of 335 feet a stratum of good water-bearing sand and gravel was struck, from which a good supply of water was obtained; each well, when pumped, showed a yield of 1,000,000 gallons in twenty-four hours. All the 2-inch wells on the west leg of the suction line were pulled up and in their stead new 6-inch tile wells were driven. A large shed for the storage of driven well material was erected at this station. At the site for the proposed pumping station near Clear Stream a test well was driven to a depth of 80 feet; good water-bearing material was encountered here. One vitrified 8-inch tile well was also driven at this site.

Lynbrook Station—At this station four new shallow wells were driven by the caisson method, all about 30 feet deep. Inside the casings of these wells a vitrified, perforated tile well was inserted and the same surrounded with gravel. When these wells were connected up, the yield from this plant increased to 2,500,000 per day. After pumping for some time, however, it was found that the ground water level had been lowered about 19 feet, and numerous complaints were received from householders in the vicinity of the station. The plant was, therefore, shut down. A deep well was also started here, but no water-bearing material has been encountered as yet. Over one hundred 2-inch house wells were driven throughout the village of Lynbrook.

Rockville Centre Station—All the wells at this new station were completed, the suction main laid, the wells connected up and the necessary pipe laid and connections made for delivering into the 48-inch mains.

Agawam Station—The old wells at this station were cleaned and repaired, and eight new vitrified tile wells were driven. These latter have shown good results.

In order to locate a site for a new deep well station within the Borough, one shallow and one deep test well were driven at the intersection of Alabama and Vienna avenues, near Fresh Creek, East New York. A good supply of water was obtained from the shallow well, which was driven to a depth of 60 feet. The deep well was driven to a depth of 434 feet. Clay was encountered at a depth of 148 feet; above this clay bed, the material is mostly good water bearing sands and gravels. Below the clay, the strata encountered were also good water bearing materials. The indications are that a good supply of water can be obtained at this station.

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In addition, numerous test wells were driven in the vicinity of Bellmore, Wantagh, Seaford and, Massapequa, borings were made for the foundations for the proposed new pumping station at Massapequa, and house wells were driven in the vicinity of Springfield, Forest Stream, Aqueduct, Rosedale and Oconee.

Pumping Stations. Work Done Under Contract.

Contract for remodeling the Ridgewood North Side Pumping Station, Fuller & O'Connor, contractors; dated April 3, 1907.

Work under this contract was continued by the contractors throughout the year the progress on same, however, was not altogether satisfactory. During the year the new chimney was erected; the driving of the steel sheet piling for the pump well, which commenced in the latter part of 1907, was completed; the concrete piling for the foundations of the walls of the building was started and by the end of the year about one-half of the piles called for had been driven; the concrete area walls were built; some work was done on the wall between the engine and boiler rooms; the work on the concrete foundations for two of the engines was started; the concrete walls for the 36-inch pipe trench through the cellar of the boiler room were finished; and the 48-inch and the 36-inch discharge mains were laid. Some work was also done upon the erection of the new coal shed east of the old building.

Contract for furnishing, delivering and erecting a new pumping plant in the remodelled Ridgewood North Side Pumping Station, Davis & Farnum Manufacturing Company, contractors, dated November 28, 1906:

Three of the four engines called for under this contract have been completed and erected in the shops. All the castings for the fourth engine have been finished, but no work can be done on the erection of same owing to the crowded condition of the shop. As soon as the building at Ridgewood has been completed sufficiently to receive some of the finished machinery, the latter will be shipped and the fourth engine erected at the shop before being shipped also.

Contract for furnishing, delivering and erecting eight (8) water tube boilers in the remodelled Ridgewood North Side Pumping Station, Heine Safety Boiler Company, contractors, dated February 5, 1907.

All of the boilers called for under this contract have been completed and have been ready for shipment for some time. No further work can be done on this contract until the construction of the building has advanced sufficiently to permit the erection of the boilers.

Contract for completing the work to be done under the contract for furnishing, delivering, erecting and connecting four water tube boilers at the new Ridgewood Pumping Station, Borough Construction Company, contractors, dated April 29, 1908:

The work under this contract was completed on September 18 and the boilers have been in regular service since that date. The final estimate under the contract has been prepared and forwarded for payment. The total amount of work done was $3,500.

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Contract for furnishing, delivering and erecting a temporary pumping plant at the new Ridgewood Pumping Station, Borough Construction Company, contractors, dated September 18, 1905.

The temporary 20,000,000-gallon engine called for under this contract has been completed and ready for use since the early part of 1907. It has not as yet been put into service or the required test made because of the fact that owing to the delay in the completion of the new boilers at this station, the Department has been unable to furnish the necessary steam to operate the engine under contract conditions. Now that the boilers have been completed, it is expected that the engine will be tested and put in regular service without further delay.

Contract for furnishing and erecting two new brick chimneys at the new Ridgewood Pumping Station, H. R. Heinicke, Inc., contractors, dated September 21, 1905:

The east chimney was completed during 1907, but no work was done on the erection of the west chimney until September, 1908, as pending the completion of the new boilers, the Department had been unable to turn over the old chimney to the contractor for demolition. During September the old chimney was torn down and the erection of the new chimney begun. Very good progress was made on the work and the chimney was completed in December and immediately put in service. The final estimate on the contract has been prepared and forwarded for payment. The total cost of the work done under the contract was $8,475.

Contract for erecting one pumping engine at the new Gravesend Pumping Station, Snow Steam Pump Company, contractor, dated September 26, 1905:

The engine called for under this contract has been completed for some time, but has not been put in regular operation pending the completion of the new wells at this station. Meanwhile, six new wells were driven by the Department men and connected up with the new engine and an attempt was made to run the engine, but without satisfactory results, owing to the abnormal conditions at the plant, such as the insufficient yield of the wells and the great variation in pressure in the distribution mains. It is proposed to install on the engine a new governor that will automatically control its speed and with this improvement it is expected that the pumping unit can be put into operation within a short time.

Contract for erecting two boilers and one economizer at the new Gravesend Pumping Station, Thomas F. Purcell, contractor; dated January 28, 1907:

The two marine boilers and the economizer called for under this contract have been entirely completed and are practically ready for the test required by the specifications. The contractor, however, is waiting for the station to be placed in regular service before proceeding with the test.

Contract for erecting the necessary steamfitting at the new Gravesend Pumping Station, William Horne Company, contractors, dated September 2, 1905:

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The contractors have, practically, completed the work on this contract; all that remains to be done by them is the connection to the driven well receiver, which will be done as soon as the receiver is set in place by the contractors for the wells.

Contract for erecting a concrete culvert and doing all grading at the new Gravesend Pumping Station, Walter M. Bristow, contractor; dated April 26, 1907:

The work done during the year on this contract consisted of completing the well trench and the sodding of the banks of same. All of the work was completed on July 18, 1908. The final estimate was prepared and forwarded for payment. The total amount of work done under the contract was $20,972.02.

Contract for erecting the Canarsie Pumping Station, Richard Whalen & Co., contractors; Henry Newman, assignee; dated July 15, 1905:

During the year the concrete and slate roof of the building was erected and the cornices and gutters put in place and painted; the concrete floors were put in, the iron stairs built, and all plumbing, gas pipes, etc., done. The building was entirely completed on September 11, 1908. The final estimate has been prepared and forwarded; the total amount of work done under the contract was $23,781.

Contract for erecting concrete coal shed and culvert and doing all grading, etc., at the Canarsie Pumping Station, Newman Construction Company, contractors, dated October 12, 1906:

During the year the concrete culvert under Remsen avenue was constructed, about 26,000 cubic yards of earth were excavated for the well trench, 4,000 cubic yards of top soil placed, 138,000 square feet of sodding done and 1,230 square yards of granite paving laid. The work was entirely completed on September 22, 1908. The final estimate on the contract has been prepared and forwarded; the total amount of work done was $34,897.03.

Contract for erecting two pumping engines at the Canarsie Pumping Station, Marine Engine and Machine Company, contractors, dated June 22, 1906:

Good progress was made by the contractors on the erection of the engines, specially in view of the conditions at the station. The engines are practically completed but the connections to the suction mains and wells cannot be made until these have been installed.

Contract for erecting three boilers at the Canarsie Pumping Station, B. Franklin Hart, Jr., & Co., contractors, dated June 5, 1906:

The erection of these boilers has been completed; some changes, however, will have to be made in the steamfitting on the boilers and in the rockers on the grates before they will be accepted and the final estimate on the contract forwarded for payment.

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Contract for erecting the necessary steamfitting at the Canarsie Pumping Station, Blake & Williams, contractors, dated June 6, 1906:

The work under this contract, which had been held up pending the erection of the engines and boilers, was started in September. Since then very good progress has been made by the contractors and it is expected that the work will be completed very shortly.

Contract for erecting two pumping engines at the new New Lots Pumping Station, Marine Engine and Machine Company, contractors, dated December 15, 1905:

These engines, which were completed during 1907, were finally tested in April with good results. The engines have been accepted, and the final estimate on the contract was forwarded for payment on July 15, 1908. The total cost of the work was $38,750.

Contract for erecting one pumping engine at the Mount Prospect Pumping Station, Henry R. Worthington, contractor, dated August 24, 1908:

Bids for this work were received on July 15, 1908. The contract was awarded to Henry R. Worthington, signed on August 24, and the contractor ordered to begin work on September 15. Very good progress has been made upon the manufacture and erection of the engine, and it is expected that it will be completed and ready for operation early in February.

Contract for erecting two new chimneys at the Millburn Pumping Station, H. R. Heinicke, Inc., contractors, dated October 12, 1908:

On September 22 bids for this work were received. The lowest bidders were H. R. Heinicke, Inc., and the amount of their bid was $4,640. The contract was awarded to them and they were ordered to commence work on November 9, 1908. The old east chimney has been already taken down and work has been started on the erection of the new one.

Contract for furnishing, delivering and erecting new pumping stations near Smiths Pond, Clear Stream and Valley Stream, L. I.:

Bids for this work were received on October 7, 1908. The lowest bidders were the Gurlitt-Manning Company, the amount of their bid being $19,650. The contract was awarded to them and they were ordered to commence work on December 21, 1908.

On October 7, bids were also received for the work of erecting the pumping plants at the above stations, near Smiths Pond, Clear Stream and Valley Stream. All the bids, however, were rejected by the Commissioner. It is expected that the contract will be readvertised early in the year.

The form of contract and specifications for remodelling the boiler plant at the Millburn Pumping Station were prepared and forwarded for approval and printing in June. The contract has been printed and is now ready for advertising. The plans for the work have been completed.

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Forms of contract and specifications for an additional boiler at the Mount Prospect Pumping Station were prepared and forwarded for printing. The plans for same have been completed.

Plans have been prepared and signed for the remodelling of the Jameco Pumping Station, including the erection of two new pumping engines, a new boiler plant and the necessary steamfitting. The contract has been printed and is ready to be advertised.

On September 24, 1908, a contract was entered into with Mr. Walter E. Parfitt, Architect, for the preparation of complete plans and specifications for and the supervision of, the construction of the proposed pumping stations at Wantagh and Massapequa. Said plans and specifications were completed by Mr. Parfitt and submitted. They were approved and signed early in December, and on December 23, 1908, the contract forms and specifications were forwarded for printing. The contract forms and specifications for the engines, boilers, etc., for said proposed pumping stations have also been prepared and forwarded for printing.

The plans and specifications for the necessary steamfitting and breeching at the remodelled Ridgewood Pumping Station have been completed. The draft of contract for this work was forwarded for approval and printing on December 15, 1908.

Forms of contract and specifications for the installation of electric light equipment at the Gravesend, Canarsie and New Lots pumping stations were prepared early in the year and forwarded for printing. The plans for this work have all been completed. The contract has been printed and is ready for advertising.

Work has been started on the preparation of the necessary plans and specifications for a coal shed at the Millburn Pumping Station, where no facilities exist at present for the proper storage of coal.

Studies have been made and preliminary plans prepared for an air lift driven well plant at the Ridgewood South Side Station.

Studies have been made for and some preliminary work done on the proposed installation of a pumping plant at Alabama and Vienna avenues.

Pumping Stations—Work Done by Department Men.

At Gravesend Station, a suction main was laid, connecting the old system of wells to the new pumping engine, and the new wells, driven by the Department men, were also connected up.

At Aqueduct Station, the Morris centrifugal pump was removed, and in its place a new four-million gallon Deane engine was erected. All the necessary steamfitting for this engine, including exhaust and steam piping between the engine and the condenser, was also erected by the Department men. The suction lines were connected up to the new engine, and a discharge pipe laid from same to the 72-inch steel pipe line. A branch delivery main was laid and connected to the weir box. This

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engine was put in operation on May 30, and has been giving entire satisfaction since that date.

At Oconee Station, the old Davidson engine was removed and a new 4,000,000-gallon Deane engine was erected in its place and connected to the suction main from the wells. A discharge line was laid from this engine to the 72-inch steel pipe line, a distance of over 300 feet; a branch line was also laid to the weir box, and all steam and exhaust piping between the boilers, engine and condenser erected. The installation of this engine was completed and the engine put in operation during the last week of June.

At St. Albans Station, the shallow wells driven by P. H. & J. Conlan were connected up to the suction main and put in commission.

At Clear Stream Station, the shallow wells driven by the Department men were connected to the suction line. At the site for the proposed new pumping station near Clear Stream, the work of excavation for the trench for the new suction main has been completed and the main is now being laid.

At the Forest Stream Station, a Davidson feed pump was erected in the fireroom and connected to the boilers, and a locomotive boiler, which was formerly at Ridgewood, was shipped to this station and installed, thus increasing the boiler capacity at the station.

At Lynbrook Station, the work of installing the machinery and connecting up the wells was completed and the plant was put in operation on June 9. As already mentioned, the yield from the wells not proving satisfactory, the plant was shut down at the end of June. Four new wells were then driven and connected up, and the other wells pumped and cleared, and the station was started again on September 29. The yield was increased, but as already stated, the plant had again to be shut down, owing to the lowering of the ground water level in the vicinity of the station.

At Rockville Centre, a great deal of work was done on the building of the new station, and the installation of the engines, boilers, etc. The wells were completed, the suction mains laid and the wells connected up to the same. The delivery main has also been laid. This station will probably be completed and put in operation early this year.

## Additional Pipe Conduit.

The 72-inch steel pipe line from Ridgewood to Valley Stream was continued in service during the year as an auxiliary to the old brick conduit. The pumping stations connected with it and which deliver their supply into it are now six in number, as follows: Oconee, Aqueduct, Shetucket, Morris Park, St. Albans and Springfield.

The contract forms and specifications for the extension of this pipe line to Amityville were completed and forwarded for approval and printing on January 15, 1908.

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The contract plans for the work, comprising sixty-three separate detail drawings, were completed and signed early in the year.

On June 19, 1908, the Board of Estimate and Apportionment approved the maps of the lands to be acquired for this purpose, and on December 15, 1908, the Commissioners of Appraisal were appointed, and title to the lands vested in the City. The contract forms were finally printed early in July, and the contract advertised. Bids were received on July 31, 1908. Eight bids were received, the names of the bidders and the total amounts of their bids being as follows:

| | |
|---|---|
| The T. A. Gillespie Company, Type D | $1,879,390 00 |
| Cooper, Evans & Bryson Company, Type A | 1,909,052 50 |
| Ryan-Parker Construction Company, Type C | 1,925,460 00 |
| James H. Holmes, Type B or C | 2,016,132 50 |
| The T. A. Gillespie Company, Type A | 2,033,865 00 |
| John J. Hart Company, Type A | 2,152,915 00 |
| Stewart-Kerbaugh-Stanley Company, Type D | 2,175,520 00 |
| Henry B. Reed, Type B | 2,345,000 00 |

On August 3, 1908, I reported to you upon the canvass of the bids, recommending that the contract be awarded to the lowest bidders on Type D, the T. A. Gillespie Company. No action was taken upon the award of the contract, however, until October, when the decision of the Courts upon the injunction proceedings instituted by the next lowest bidder to the contract was rendered in favor of the City. The contract was at once awarded to the T. A. Gillespie Company and signed on November 6, 1908. The contractors were directed to begin work on November 16, 1908. The contractors immediately started the work of grading at several points, but no rapid progress can be made until the buildings on the lands acquired, which are on the line of the work, are removed. Good progress is being made, however, upon the manufacture of the pipe.

The work of staking out the final position of the pipe line from Clear Stream to Amityville was started about September 1, and good progress is being made on same. It has been found that the base line which was run in 1906 along the centre of the eastbound track of the Long Island Railroad from Valley Stream to Amityville, has been practically destroyed, owing to the shifting of the rails, and the remaking of the roadbed and the placing of new ties. This base line must be resurveyed before the pipe line can be properly staked. Work on the rerunning of this base line has been started and is being prosecuted vigorously, so that there will be no delay from this source when the contractors are ready to lay the pipe.

### Infiltration Galleries.

Wantagh—The plant was turned over to the City by the contractors on April 6, 1908, and since that date has been operated by the Department. The rental period

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terminated on September 18, 1908, and the work was finally accepted by the City on that day. The final estimate on the contract was prepared and forwarded for payment. The total amount of work done was $121,775.71.

An earth dam was built across Wantagh Stream at about 200 feet below the gallery, and on September 18, the waste plugs were removed from the lower Wantagh Pond, the water from same being delivered through a double flume into one of the manholes of the gallery, where it is pumped into the conduit. The influx ends of these flumes are protected by gates and screens, and gratings are suspended in the manhole to break the fall of the water into the gallery. No pumping was done from this gallery during the first six months of the year. The plant was started on June 24, and has been in regular operation since then.

The amount pumped was as follows:

| Month. | Total Pumped. U. S. Gallons. | Average Per Day, U. S. Gallons. |
|---|---|---|
| June | 107,523,000 | 15,360,429 |
| July | 479,298,000 | 15,461,226 |
| August | 490,660,000 | 15,827,742 |
| September | 468,699,000 | 15,623,300 |
| October | 494,751,000 | 15,959,710 |
| November | 478,149,000 | 15,938,300 |
| December | 490,717,000 | 15,829,581 |
| Total | 3,009,797,000 | 15,758,099 |

Massapequa—On the west leg of this gallery all the manholes were cleaned and the surface over the gallery was graded. On the east leg, 2,104 feet of 36-inch vitrified pipe gallery were laid, and eight manholes constructed. All the work was completed and accepted by the City on October 3, 1908. The final estimate has been prepared and forwarded for payment; the total amount of work done under the contract was $332,447.65. The pumping station was turned over to the City on September 1, 1908, and has been operated by the Department since that date. The amount pumped at this gallery during the year was as follows:

| Month. | Total Pumped. U. S. Gallons. | Average Per day, U. S. Gallons. |
|---|---|---|
| January | 69,219,000 | 8,652,375 |
| February | ..... | ..... |

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| Month. | Total Pumped. U. S. Gallons. | Average Per day, U. S. Gallons. |
|---|---|---|
| March | 21,762,000 | 21,762,000 |
| April | 529,524,000 | 17,650,800 |
| May | 555,286,000 | 17,912,452 |
| June | 519,744,000 | 17,324,800 |
| July | 539,359,000 | 17,398,677 |
| August | 561,319,000 | 18,107,064 |
| September | 627,864,000 | 20,928,800 |
| October | 700,856,000 | 22,608,258 |
| November | 680,943,000 | 22,698,100 |
| December | 667,754,000 | 21,540,452 |
| Total | 5,473,630,000 | 19,273,345 |

Surveys—A base line survey along the centre line of the conduit from Spring Creek to Clear Stream, together with the locating of monuments and side lines of our property was completed during the year. This base line has been co-ordinated for the purpose of plotting and calculating the areas of lands recently purchased. A new map will now be prepared, to the scale of 50 feet to 1 inch, showing not only the new purchases, but the full width of our property.

A topographical survey was made and a map prepared of the site for the proposed new pumping station at Wantagh.

A survey was made of the Hardenbrook property, just south of the Rosedale Pumping Station and west of the old Rockaway Beach Railroad, and the deeds covering the property were investigated at Jamaica. This property had already been acquired by the City, but the former owners disputed the accuracy of the original condemnation map. This later survey upholds the original work.

Surveys were made for the proposed connections to the 72-inch pipe line from the Jameco and Forest Stream Pumping Stations.

Surveys and maps were made and old deeds investigated of lands in the Rosedale and Clear Stream districts in the matter of application of the Long Island Railroad Company for additional strips of land.

Surveys were made of lands at Unqua and Pines Streams, for the purpose of fencing said properties. A line of section levels were run north and south of the infiltration galleries, along Washington and Jackson avenues, Seamans Neck, Hicksville, Bethpage, Wurtenberg and Unqua roads, Clocks boulevard and County Line road.

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Field traverses are also being run in the district bounded by Newbridge road on the west and Amityville on the east, extending about four miles north of the conduit and about one mile to the south. These traverses will be used later in making detail surveys of the various farms in litigation. In the office, these traverses are being properly co-ordinated and plotted on a scale of 500 feet to 1 inch, the map showing also the roads and test wells.

Damage Suits—A great deal of work was done during the year in the preparation of testimony for the defense of the various suits which have been brought against the City by owners of farms along the watersheds, for damage to their property due to alleged diversion of water by the City's driven well stations. Some of the work done in this connection was as follows:

Surveys made and maps and records completed for the case of the John Kinsey farm, near Springfield. A topographical survey and a survey of the normal underground water level of the farm of Fred. Reisert, adjoining Watts Pond, Valley Stream, were made. In addition to the surveys, daily observations of the underground water were taken in the vicinity of the Kinsey and Reisert farms, and the pumping records of the Springfield, Forest Stream and Watts Pond Pumping Stations, were completed, together with the elevations of the water in the ponds and in the test wells at the pumping stations.

Surveys were made of farms owned by Edwin Snow, Petty estate, Moses Hunt, George Bloomer, Chris. Hunt and Thomas Willis, and all the necessary maps and records prepared for the defence of the suits brought against the City.

About fifty other suits have been brought against the City for alleged lowering of the water table to the north and south of the galleries. The detail surveys of all these farms have been started.

Test Wells—During the year, many new 2-inch test wells were driven in the Wantagh and Massapequa districts. These test wells, as well as those driven in 1903 and 1905, are being located and elevations taken on the tops of the wells. Weekly observations of the underground water table were taken during the year in all of the 2-inch test wells from Spring Creek to Babylon. These observations, together with those taken in previous years, have been entered in new books, expressly prepared for the purpose. The plotting of these observations on a uniform scale has also been started.

Contracts—The following is a list of the contracts for work on the extension and improvement of the supply which were prepared during the year and forwarded for approval, printing and advertising:

For furnishing, delivering and laying a 72-inch steel pipe line and appurtenances from Valley Stream to Amityville, Long Island.

For furnishing and delivering well driving machines.

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For furnishing and erecting two new brick chimneys at the Millburn Pumping Station.

For remodeling and extending the Jameco Pumping Station.

For remodeling the boiler plants at the Millburn Pumping Station.

For furnishing and installing steam turbines, generators and electric lighting equipment at the New Lots, Gravesend and Canarsie Pumping Stations.

For sinking shallow wells and laying suction mains at Canarsie and Gravesend Pumping Stations.

For services of Walter E. Parfitt, architect, for the preparation of complete plans, specifications, etc., and the supervision of the construction of the proposed concrete foundation, concrete piling, etc., required in constructing and remodeling the Ridgewood North Side Pumping Station, and of the proposed coal shed at the same station.

For services of Walter E. Parfitt, architect, for the preparation of preliminary drawings and specifications for proposed pumping stations at Wantagh and Massapequa, Long Island.

For services of Walter E. Parfitt, architect, for the preparation of complete plans, specifications, etc., and the supervision of the construction of the proposed pumping stations at Wantagh and Massapequa, Long Island.

For furnishing, delivering, erecting and connecting a boiler plant at the Mount Prospect Pumping Station.

For furnishing, delivering and installing pitometer pump slip indicators, at the Ridgewood and Millburn Pumping Stations.

For furnishing, delivering, erecting and connecting a complete pumping plant at the proposed Wantagh Pumping Station.

For repairing and making water-tight the Millburn Reservoir.

For furnishing, delivering, erecting and connecting the necessary steam fitting and appurtenances at the remodelled Ridgewood North Side Pumping Station.

For furnishing, constructing and erecting a new pumping station, complete, at Wantagh, Long Island.

For furnishing, constructing and erecting a new pumping station, complete, at Massapequa, Long Island.

For furnishing, delivering, erecting and connecting a complete pumping plant at the proposed Massapequa Pumping Station.

The following is a list of contracts for work on the extension and improvement of the supply for which bids were received during the year, together with the names of the lowest bidders and the total amount of their bids on the basis of the Engineer's estimate of the work to be done:

April 1—For completing the work to be done under the contract for four new water tube boilers at the new Ridgewood Pumping Station: Borough Construction Company, $3,500.

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July 15—For erecting one pumping engine at the Mount Prospect Station: Henry R. Worthington, $16,500.

July 31—For furnishing, delivering and laying a 72-inch steel pipe line and appurtenances from Valley Stream to Amityville, Long Island: The T. A. Gillespie Company, $1,879,390.

August 26—For furnishing, delivering and erecting coal weighing scales at various pumping stations:

| | | |
|---|---|---|
| Section 1. | McHarg-Barton Company | $23,000 00 |
| Section 2. | Motley, Green & Co | 6,120 00 |
| Section 3. | J. H. O'Brien Scale and Supply Company | 2,450 00 |
| Section 4. | Standard Scale and Supply Company | 480 00 |

September 23—For erecting two new brick chimneys at the Millburn Pumping Station: H. R. Heinicke (Inc.), $4,640.

October 7—For erecting new pumping stations near Smiths Pond, Clear Stream and Valley Stream: Gurlitt-Manning Company, $19,650.

October 7—For erecting new pumping plants, complete, at Smiths Pond, Clear Stream and Valley Stream: J. C. McQuarrie & Co., $45,400.

October 28—For sinking shallow wells and laying suction mains at Canarsie and Gravesend Pumping Stations:

| | | |
|---|---|---|
| Section 1. | Phoenix Construction Company | $20,409 50 |
| Section 2. | Phoenix Construction Company | 13,892 30 |

October 28—For furnishing and delivering well driving machines: Keystone Driller Company, $4,500.

Supply—Maintenance and Repairs.

Pumping Stations—Operation and Maintenance.

Mount Prospect—The consumption of water in the districts supplied by the Mount Prospect Reservoir has continued to increase, and it has been necessary to operate one of the engines at the Mount Prospect Station for 294 days during the year, as the Davidson engines at Ridgewood were unable to furnish the required supply. The total amount pumped into the reservoir was 857,992,000 gallons, or an average of 2,918,300 gallons per day.

In the tower service districts the consumpetion increased from a daily average of 6,642,000 in 1907 to a daily average of 8,444,000, and it was necessary to operate the steam turbine engine almost continuously during the year, in addition to the Davidson engines. The new engine at this station, now being installed by Henry R. Worthington, will materially aid in meeting the growing consumption.

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During the year the turbine engine received a thorough overhauling; a new turbine wheel shaft and pinion, one new coupling and new journal boxes were fitted to it. Since these repairs were made, the engine has been running very satisfactorily, less steam is being used to run it, and the noise due to its operation has been reduced very materially. The other engines at this station are in good condition, only minor repairs to them having been necessary during the year. The boilers are also in good condition; they were washed and cleaned at regular intervals during the year. The interior of the station was painted, and roofs, etc., repaired.

Gravesend—The average amount of water pumped per day at this station during the year was 3,212,400 gallons, about the same as that pumped last year. Minor repairs were made to engines and boilers but no extensive repairs to them can be made until the new plant is put in operation. It is expected that the new wells will be completed early this year, and the new station put in service.

New Utrecht—The average amount of water pumped per day at this station was 1,120,000 gallons, slightly less than that pumped last year. Only minor repairs to the engines were required, as they are in fairly good condition. Extensive repairs had to be made to the boilers, specially Nos. 1 and 2, which had been condemned by the Police Department. The station building was repaired and painted during the year.

New Lots, Old Station—The average daily pumping at this station during the year was 2,176,200 gallons. The steam valves, steam pistons and water rods of the engines were repacked, as required. The plungers were refitted with new leathers; the water ends were examined and new valves, springs and guards placed where necessary. Small repairs were made to the boilers, as required, and they were all cleaned, scaled and washed regularly during the year. During the latter part of March, a section of the old smokestack at this station was blown off by the wind. A new steel stack, 42 inches by 70 feet, was ordered, and was erected in place of the old one. This new stack has materially improved the station.

New Lots, New Station—The average amount of water pumped per day at this station was 4,682,700 gallons. Extensive repairs were made to the engines by the contractors, the Marine Engine and Machine Company, in preparation for the official test, which took place in April, with satisfactory results. Since that time, only minor repairs to the engines have been necessary. The boilers were all fitted with a new set of shaking grate bars of ¾-inch air space. The tubes of the superheater of boiler No. 2 were rolled, the bridge walls rebuilt and the arches in combustion chamber repaired. All the boilers were cleaned, scaled and washed in turn during the year.

Ridgewood, North Side—The engines at this station were all kept in almost continuous operation during the year. The average amount pumped was 82,602,000 gallons per day.

Triple Engine No. 1—During the first quarter this engine was refitted with a new set of compensating cylinder glands, a new set of tee heads and one new compensating

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ram. The engine was also refitted with a new high pressure piston. The main exhaust heater was thoroughly overhauled and refitted with new tubes, and the old cast iron heads were removed and replaced by brass ones. A number of new tubes were placed in the condenser during the year. Pump valves were renewed where required. The usual repackings were made.

Triple Engine No. 2—During the year new compensating cylinder rams with glands, one new accumulator ram with gland and four new brass trunions were fitted to this engine. A new air compressor for this engine was also installed. The cast iron tube heads on the main exhaust heater were removed and replaced with new tubes. Other minor repairs, such as repacking, replacing pump valves, etc., were made as required.

Triple Engine No. 3—This engine was fitted with a new high pressure piston, several worn parts of cutoffs were rebushed and the suction pipe to the pump was repaired. The condenser was repaired and the reheater on the intermediate pressure cylinder was taken down and repaired, a number of the old tubes being removed and replaced with new ones. The main exhaust heater was also repaired and refitted with a number of new tubes. The air pump was refitted with new suction valves. In addition, the compensators, accumulators, steam piston boxes, etc., were repacked, as required.

Beam Engine—This engine was put out of service on March 23, principally on account of the bad condition of the west wall of the engine room, the foundation of said wall having been weakened by the driving of the steel sheet piling for the new engine house building. While out of service, the engine was thoroughly overhauled, the following repairs to it being made:

The main cylinder head was taken out, the steam piston removed and taken apart, rings and springs taken out and all repaired and put back in place. The steam and exhaust valves were taken out, their seats refaced and the stems turned. All metallic packing was removed and refitted. The beam centre caps were removed on the west side of engine, rebabbitted, bored and put back in place. Shaft on outboard bearing was raised and relined. New crank pin brasses were installed and new guard bolts refitted to crank pin strap. The beam pin on front end of beam and also fork end of beam were refitted with new keys. A new 4-inch galvanized iron pipe for main injection was installed. The main pump was examined and several new valves put in. The main upper pump and the air pump were repacked. Finally the engine was cleaned and painted. All the above repairs were completed and the engine put in operation on May 28. This engine is now in first class condition.

Davidson Engines—The water cylinder lining of Engine No. 3, which had worn very thin, was removed and replaced with new lining. At the same time a new pump rod, with new stuffing box, was made and put in place. Repairs were made to the injection valves of both condensers; a new spray pipe was put in No. 1 condenser

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and both air pumps were refitted with new valves and springs. The feed pump was refitted with a new water cylinder lining, new plunger, new Tobin bronze pump rod, and it was equipped with a new set of valves. The usual repackings were made, as required.

Morris Boilers—The three lower rows of tubes of boilers Nos. 1, 7, 8, 9 and 10 were taken out and replaced by new ones. Eighty-four tubes were removed from boiler No. 3, and forty-eight from boiler No. 5, and replaced by new ones. New England roller grates were installed in boilers Nos. 2, 7 and 10 during the year. Boilers Nos. 1, 5 and 6 also have this type of grates. Good results have been obtained from these boilers since the installation of these grates. The main steam line over boilers Nos. 1 and 4 was repaired, a section of the line being cut out and replaced by extra heavy pipe. All these boilers were cleaned and washed regularly; they were also tested during the year by the Police Department, with good results.

Davidson Boilers—Boilers Nos. 13, 14, 15 and 20 of this battery were thoroughly overhauled during the year and minor repairs were made to boilers Nos. 16, 17 and 18. The feed pipes were furnished with new valves, and the feed pump was refitted with a new water cylinder lining, new plunger and new rod. All the boilers were cleaned and washed at regular intervals during the year. They were also tested and passed by the Police Department.

Ridgewood, South Side:

The engines at this station were all, except No. 3, kept in almost continuous operation; the average amount pumped during the year was 43,937,400 gallons.

Worthington Engine No. 1—During the third quarter of the year a crack appeared in the low pressure jacket of this engine, in close proximity to the old patch which covered two former cracks. The old patch was removed and a wrought iron patch, 30 inches by 42 inches, was placed over the three cracks. The engine was shut down for these repairs about a week. During the shut down, all steam valves were repacked, the jacket pipes repaired, the air compressor refitted with new valve chambers, new steam valve, new valve rod and two air valves. The usual repackings were made, as required. The water ends were examined as often as it was found necessary and a number of rubber valves, springs, plates and guards were replaced.

Worthington Engine No. 2—The valve stems, the steam and water rod boxes, the balancing cylinder and the compensator and accumulator rams were repacked, frequently, during the year. The water rods were examined as often as necessary and a number of rubber valves, springs, plates and guards were replaced.

Worthington Engine No. 3—In the last week of September this engine was turned over to the repair gang from the shops of H. R. Worthington, the contractor, for a thorough overhauling. The repairs made have been very extensive and have not as yet been completed. Good progress has been made on the work, however, and the engine will probably be put in operation early in February.

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Worthington Engine No. 4—The steam valve rod boxes, the steam and water piston rod boxes, the balancing cylinder, the compensators and accumulators were repacked every month during the year. The water ends were examined regularly and all valves, springs, etc., were replaced, as required.

Worthington Engine No. 5—On this engine the usual repackings of steam valve rod boxes, balancing cylinder, etc., were made, when found necessary. The water ends were often examined and rubber valves, springs, etc., replaced. The new feed pump furnished by H. R. Worthington was erected in the new pump room and connected up. The second heater was taken out of the cellar and connected up, together with the first one installed, to the new feed pump. The old Worthington feed pump was entirely overhauled and refitted with new plungers, new piston and valve rods, etc. It was also set and connected up to the heaters and boilers. During the installation of the new feed pump, Copes feed water regulators, for maintaining a constant water level in the boilers, were installed, for trial, on each of the Babcock & Wilcox boilers. A Copes pump governor was also connected up to the steam lines of the feed pump for maintaining the pressure in the boiler feed line at a fixed excess over the boiler pressure and for regulating the discharge of the pump. This installation has proved successful so far, but a thorough test will be made at varying pressures before the installation is finally approved. All piping leading from the heaters of the five engines was removed, thoroughly cleaned and put back in place. The circulating pump was removed from the Strong boiler room, set up and connected in the new pump room.

Strong Boilers—This battery was put out of service early in October, so as to permit the contractors for the new chimneys to demolish the old west chimney and erect the new one. While out of service these boilers were thoroughly overhauled and cleaned, the steam piping renewed and valves repaired.

Babcock & Wilcox Boilers—During the year these boilers were fitted with new shaking grates, with ¾-inch air space. A new Thompson damper regulator was set up and connected to the main damper and is now operating same. All the boilers were cleaned, scaled and washed regularly.

Locomotive Boilers—This battery of boilers was put out of service on March 23 and the work of fitting each boiler with new door frames was taken up. While the boilers were shut down they were thoroughly cleaned, scaled and washed. They were put in commission again on May 28, and they have been in continuous service since that date. Four steel smokestacks were installed on this battery during the last quarter, also two new sets of grate bars. These boilers are now in very good condition.

Spring Creek—Engine No. 1 at this station was overhauled and refitted with new valve rods and high pressure piston rings; the water and steam ends were repacked. Engine No. 3 was also overhauled during the year. Minor repairs were made to engine No. 2, as required. The vacuum pump of engine No. 3 was repaired

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and refitted with new piston rods. The boiler feed pump was overhauled and the main steam pipe repaired. The boilers were washed and cleaned regularly; their furnaces were relined during the year.

Woodhaven—The engine at this station was overhauled, the valves and piston rod boxes were repacked, water end repaired and a number of new valves placed. A water gauge was set on the discharge pipe to the 72-inch pipe line. The boiler was cleaned and washed each month.

Aqueduct—The new Deane engine at this station, erected during the early part of the year, has been running continuously, only minor repairs being necessary. The centrifugal pump was repaired and kept ready for operation as a reserve unit. The boilers at this station were cleaned and washed regularly during the year; only minor repairs to them were required.

Shetucket—The Worthington engine at this station has been operated regularly during the year, only minor repairs to it being necessary. The centrifugal pump was run occasionally to keep in readiness for service when necessary. The boiler was overhauled during the year, a number of leaky tubes were cut out and replaced and a leak in the steam drum was repaired. The boiler was cleaned and washed regularly.

Oconee—As already mentioned, a new Deane pumping engine was erected at this station during the second quarter and connected up to the suction and discharge mains. This new engine was put in operation in the last week of June and was kept in service until the latter part of September, when it was shut down for repairs to the cylinder lining and for the usual repackings. Minor repairs were made to the Davidson engine, as required. The boilers were cleaned, scaled and washed at regular intervals. The furnaces of boiler No. 2 were relined and its bridgewall rebuilt.

Morris Park—The engine at this station was shut down for repairs during May. All the valve and piston rod boxes were repacked, new valves and springs placed where required. The engine has been in good condition since then. The boiler was shut down each month, cleaned, scaled and washed.

Baiseleys—Repairs done to the engine at this station were the repacking of all valves, steam and water rod boxes, the examination of water ends and the placing of a large number of new valves and springs. Air pump No. 1 was thoroughly overhauled anl repaired. The boilers were cleaned and washed regularly during the year.

Jameco—The Worthington engine at this station was thoroughly repaired during the year. Repairs, such as repacking of all rod boxes, etc., were also made to the Davidson engine. The Davidson air pump was repaired, the water end being refitted with new valve springs and plates. The filter engine was also overhauled and placed in good condition. Each one of the boilers was cleaned and washed after every thirty-day run. All the boilers were fitted with new furnace door linings and a number of new grate bars were set in the furnaces.

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St. Albans—During the third quarter, the Worthington engine at this station was shut down and thoroughly overhauled. All old packing was removed from the valve and piston rod boxes and the same were repacked. The water end was overhauled, the pistons repacked and a number of new springs and valves were put in place. A new water cylinder head was put on the pump and a new counter installed on the engine. A leak in boiler No. 1 was repaired. The damper regulator was repaired. The boilers were cleaned, scaled and washed each month and are in good condition.

Springfield—The engine at this station was thoroughly overhauled during the last quarter of the year; its steam and water rod boxes were repacked, the water cylinder was examined and a number of valves, springs and guards were placed, the plunger was refitted with new leathers, and the main steam pipe was repaired. A new valve and stem, a new piston and piston rod were put on the filter engine, and its valve and piston rod boxes were repacked. The air and feed pumps also received minor repairs. The boilers were cleaned and washed after each thirty-day run; they are now in good condition.

Rosedale—The crank pin box of engine No. 1 was removed, rebabbitted, scraped and replaced; the valve and piston rod boxes and the pump shaft were repacked. The valve and piston rod boxes and the pump shaft of engine No. 2 were also repacked. Other minor repairs were made to both engines. The boilers were cleaned and washed regularly during the year. The machinery at this station is in good condition.

Forest Stream—The valve, steam and water piston rod boxes of engine No. 1 were repacked and the water end was refitted with a number of brass stud bolts, springs, plates and valves. Engine No. 2 was also overhauled; all necessary repackings being made, and new valves, plates and studs were put in place in the suction chamber, as required. The Cameron air pump which was being used on the well suction line was disconnected and in its place was erected an old Deane air pump which was formerly used at Jameco and which had been thoroughly overhauled at the Ridgewood shops. The vacuum pumps were repaired and a new water connection was made between the pumps and the discharge pipe of engine No. 1. The locomotive boiler formerly used at Ridgewood was brought here and erected by Department men. The work of installing this boiler was completed and the boiler was put in operation on August 1. Minor repairs were made to the boilers at this station, and they were cleaned and washed regularly during the year.

Clear Stream—The rod boxes of engine No. 1 were repacked, the water ends examined and a number of defective valve seats were removed and replaced with new ones. New valves, springs and guards were fitted to suction and discharge chambers. The air pump of this engine was disconnected and sent to Ridgewood shops and there thoroughly overhauled. It has again been set up here and so connected that it can be used on either of main engines. Engine No. 2 was also overhauled thoroughly; the air pump of this engine was also removed and sent to Ridgewood for repairs. A new Davidson air pump was erected here and connected to the suction receiver, and it is

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giving satisfaction. The boilers were cleaned and washed regularly. During December, boiler No. 1 was put out of service and it is now undergoing extensive repairs. All minor necessary repairs were made to the boilers during the year.

Watts Pond—Only minor repairs required were made to the engine at this station. The air pump, which was in poor condition, was thoroughly overhauled during the second quarter. The boilers were cleaned and washed each month.

Lynbrook—As already stated, this plant was completed and first put in operation on June 9. No repairs to the machinery have been necessary since that date. A new feed pump was erected and connected here during the third quarter.

Smiths Pond—All necessary repairs were made to the engines at this station during the year. When this plant is running at its full capacity, the engines are operated at their maximum piston speed, causing valve guards to work loose, springs to break, and valves to wear out quickly. In consequence, it was necessary to furnish these engines with 640 new springs and 424 new valves during the year. The boilers were washed, scaled and cleaned regularly.

Rockville Centre—The work of installing this station is progressing. It should be ready to be put in operation by February 1, 1909.

Millburn—Extensive repairs were made to engines Nos. 2, 3 and 4, by the M. T. Davidson Company, and they are now in good condition. Minor repairs were made to the other engines, as required, by the Department men. The dynamo engine was also repaired during the year. Necessary repairs were made to boiler tubes, furnaces, pipe connections, etc. The bridge walls were repaired and new dead plates and grate bars furnished to some of the boilers. Both batteries of boilers were cleaned and washed at regular intervals.

Agawam, Merrick, Matowa—These stations were in operation about 9½ days only during the first six months of the year. On June 26 they were started up and have been kept in almost constant service since. All necessary repairs were made to engines and boilers at these stations during the year.

Wantagh—This plant was operated only 4½ days during the year. No repairs of importance were made to engines and boilers.

Wantagh Infiltration Gallery—As already stated, this station was turned over to the City by the contractor on April 6 and since that date it has been run by the Department. The engines have been shut down in turn and thoroughly repaired; they are now in good condition. Extensive repairs were also made to the boilers, and they were washed and cleaned regularly. They are in good condition.

Seaford—This station was operated only on June 26, 27 and 28; on the latter date it was shut down permanently. As there is no further need of operating this plant, it will be abandoned and dismantled.

Massapequa—This station was put in operation for the first time during the year on June 26; on June 28, however, it was shut down and has remained out of service since that date. No repairs were made.

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Massapequa Infiltration Gallery—This plant was transferred to the City on September 1, 1908. Since that day it has been operated by the Department, and all necessary repairs to the engines and boilers have been made.

Ridgewood Shops—The machine, pipe, blacksmith and carpenter shops have been kept busy during the year doing a vast amount of work on repairs to machinery, pipefitting, steamfitting, etc., for the Ridgewood and all the line stations. The masons and painters have also been kept exceedingly busy making necessary repairs to buildings.

Filter Plants, Operation and Maintenance.

The slow sand filter beds at Hempstead were shut off on January 26 and remained out of commission during the rest of the year.

The Forest Stream filter beds were not running during February and March, as the beds needed cleaning; as the water was not required, however, no attempt was made to clean the bed during the cold weather. They were also shut down from April 29 to June 9 on account of repairs to boilers. On August 9 the beds were again shut down and remained out of commission the balance of the year, as the draft on the new shallow wells driven at the Forest Stream Station lowered the level of the water in the pond which fed the beds.

The Springfield filter plant was in operation intermittently only, on account of shortage of water; it was operated about 140 days out of the 366. When in operation, very satisfactory results were obtained in the quality of the effluent, percentage of bacteria removed and reduction in color and turbidity. Complete daily records were kept during the year showing the bacterial removal, color, turbidity, alkalinity, amount of alum and soda used, and all other details of the operation of the plant. These records were also kept at the other filter plants.

At Baiseley's Filter Plant, as usual, considerable time and labor was spent in repairs during the year. The air pipes and strainers were replaced in two of the tanks, new air pipes were placed in a third. The gravel and sand were washed and cleaned in several of the tanks. All the gutters in the tanks were relined with galvanized iron, three of the tanks were filled with new sand and the sand in all the others was brought up to the proper height. The valves, rods and standards were also thoroughly overhauled. The plant was in almost continuous operation during the year.

The cost of filtration per million gallons, together with a comparison of the total cost (excluding pumpage at Springfield, Baiseleys and Forest Stream), for the various filter plants, is shown in Table No. 16, attached hereto. Table No. 17, also attached hereto, shows the average results of analyses of raw and filtered water at the various filter plants during 1908.

Ponds, Conduits and Reservoirs.

The usual work of patrolling and cleaning the ponds and streams on the watersheds and of protecting the supply from pollution has been carried on during the year.

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The following table gives a summary of the work done in cleaning closets and cesspools to prevent pollution of the surface supplies:

Closets and Cesspools Cleaned.

| | |
|---|---|
| Near Fosters Meadow Stream | 2,658 |
| Near Springfield and Baiseleys Streams | 12,452 |
| Near Valley Stream and Pines Brook | 1,770 |
| Near Millburn Stream and Schodack Brook | 1,599 |
| Near Wantagh and East Meadow Streams | 1,545 |
| Along conduit line | 3,240 |
| Total | 23,264 |

The total cost of this work during the year was $7,667.05.

On April 4, 1908, a contract was awarded to Andrews Brothers for constructing piers for two bridges over the Wantagh Stream and for grading Seamans road. The contractors were ordered to begin work on April 11. Good progress has been made on the work. The buttresses and deck of the bridge at the Merrick road were completed and the bridge opened for traffic during the third quarter. Work is being done on the second bridge at Park avenue, and it is expected that the contract will be completed early in 1909.

Contracts—The following is a list of contracts for coal and other supplies for pumping stations, etc., which were prepared during the year and forwarded for approval, printing and advertising:

For furnishing and delivering miscellaneous machine tools and machines.

For furnishing and delivering 81,200 gross tons of anthracite coal.

For furnishing and delivering pipe, pipe fittings, valves, boiler tubes, etc.

For furnishing and delivering tools, garden implements, etc.

For furnishing and delivering ten horses.

For furnishing and delivering sulphate of alumina.

For furnishing and delivering lead lined iron pipe, etc.

For furnishing and delivering 50,000 gross tons of semi-bituminous coal.

For furnishing, delivering and installing pitometer pump slip indicators at the Ridgewood and Millburn pumping stations.

For furnishing and delivering 485 gross tons of anthracite coal and 4 tons of bituminous coal.

The following are the contracts for which bids were received during the year, together with the names of the lowest bidders and the amount of their bids:

January 22—For furnishing and delivering brass composition castings: Walker M. Levett Company, $2,068.75.

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January 22—For furnishing and delivering hay, straw, oats, etc.: Gasteiger & Schaefer, $11,049.25.

January 22—For furnishing and delivering lumber: A. C. Jacobson & Sons, $3,764.05.

January 22—For furnishing and delivering brick, cement, etc.: Stephen V. Duffy, $1,510.25.

January 22—For furnishing and delivering bar iron, machine and tool steel, etc.: William E. Burke, $1,029.50.

January 22—For furnishing and delivering rubber boots and coats: Manhattan Supply Company, $2,115.50.

January 22—For furnishing and delivering cotton waste: Cavanagh Brothers & Co., $1,586.

February 20—For furnishing and delivering engineers' and draftsmen's supplies: Eugene Dietzgen Company, $1,259.23.

February 20—For furnishing and delivering packing: H. W. Johns-Manville Company, $3,260.50.

February 20—For furnishing and delivering lubricating and illuminating oils and lubricating grease: J. Edward Ogden Company, $7,236.

March 4—For furnishing and delivering corporation cocks: Southern Brass Works, $3,737.50.

April 1—For furnishing and delivering iron castings: New Jersey Foundry and Machine Company, $818.

June 5—For furnishing and delivering 81,200 gross tons of anthracite coal: Rudolph Reimer, $398,346.

June 10—For furnishing and delivering pipe, pipe fittings, valves, boiler tubes, etc.:

| | |
|---|---|
| Class A—Manhattan Supply Company | $4,669 56 |
| Class B—The Crane Company | 875 74 |
| Class C—The Crane Company | 933 02 |
| Class D—Manning, Maxwell & Moore | 2,648 27 |
| Class E—Pancoast, Rogers & Richards | 3,297 50 |

June 10—For furnishing and delivering tools, garden implements, etc.: J. Edward Ogden Company, $4,175.53.

June 10—For furnishing and delivering sulphate of alumina: General Chemical Company, $2,550.

June 10—For furnishing and delivering supplies for pumping stations, reservoirs, etc.:

| | |
|---|---|
| Class A—Griscom-Spencer Company | $753 40 |
| Class B—Manhattan Electrical Supply Company | 493 65 |

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| | |
|---|---|
| Class C—J. K. Larkin | 1,432 92 |
| Class D—Thomas C. Dunham, Inc. | 1,713 27 |
| Class E—Standard Gauge Manufacturing Company | 3,223 16 |
| Class F—Cavanagh Brothers & Co. | 725 36 |
| Class G—Joseph H. Early | 352 33 |
| Class H—Manhattan Supply Company | 420 75 |
| Class I—Manhattan Supply Company | 799 55 |
| Class J—Pittsburgh Plate Glass Company | 344 30 |
| Class K—Cavanagh Brothers & Co. | 719 61 |
| Class L—Henry Frank | 1,269 12 |
| Class M—John B. Roache | 346 15 |
| Class N—New York Asbestos Company | 1,583 65 |

June 10—For furnishing and delivering machine tools and machines:

| | |
|---|---|
| Item 1—Prentiss Tool and Supply Company | $1,550 00 |
| Item 2—Niles-Bement-Pond Company | 681 00 |
| Item 3—The Fairbanks Company | 1,060 00 |
| Item 4—The Fairbanks Company | 94 00 |
| Item 5—The Fairbanks Company | 852 80 |
| Item 6—The Fairbanks Company | 51 00 |
| Item 7—The Fairbanks Company | 117 00 |
| Item 8—Vandyck-Churchill Company | 89 00 |
| Item 9—Riehle Bros. Company | 1,986 00 |
| Item 10—Keuffel & Esser Company | 285 00 |

October 21—For furnishing and delivering 50,000 gross tons of semi-bituminous coal: George D. Harris & Co., $189,842.50.

Distribution System—Extension and Improvement.

Extension of System—During the year, applications for laying water mains in 272 streets and avenues were received, investigated and reports on same were forwarded.

The work of extending the system was continued under the different contracts for hauling and laying mains; some work was also done by the Department emergency gang and by requisition. During the year, two new contracts for hauling and laying mains were let, and work on same was started. Contract forms and specifications were also prepared for a new contract for hauling and laying mains and the same were forwarded for approval and printing.

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The work done on the extension of distribution during the year was as follows:

Work Done by Contract.

Contract for hauling and laying mains, Robert Carter & Co., contractors, dated February 14, 1907:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 12-inch | 1,043 | 3 | .... |
| 8-inch | 27,509 | 75 | .... |
| 6-inch | 895 | 139 | .... |
| Total | 29,447 | 217 | 131 |

Contract for hauling and laying mains, Robert Carter & Co., contractors, dated August 10, 1908:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 20-inch | 40 | .... | .... |
| 16-inch | 8 | .... | .... |
| 12-inch | 3,609 | 10 | .... |
| 8-inch | 15,213 | 38 | .... |
| 6-inch | 587 | 90 | .... |
| Total | 19,457 | 138 | 88 |

Contract for hauling and laying mains, James Kelly, contractor, dated September 17, 1908:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 12-inch | 26 | .... | .... |
| 8-inch | 5,065 | 7 | .... |
| 6-inch | 180 | 20 | .... |
| Total | 5,271 | 27 | 26 |

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Contract for hauling and laying mains, the Bardwell Real Estate Company, contractors, dated August 11, 1908:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 12-inch | 2,616 | 4 | .... |
| 8-inch | 1,020 | 7 | .... |
| 6-inch | 90 | 12 | .... |
| Total | 3,726 | 23 | 17 |

Contract for hauling and laying mains, the Greater New York Development Company, contractors, dated September 30, 1908:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 8-inch | 1,722 | 3 | .... |
| 6-inch | 56 | 8 | .... |
| Total | 1,778 | 11 | 8 |

Contract for laying mains in Grand street extension, Gallo, Tucillo & Pitelli, contractors, dated May 1, 1908:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 8-inch | 1,746 | 4 | .... |
| 6-inch | 89 | 11 | .... |
| Total | 1,835 | 15 | 11 |

Work done by requisition, James L. Carey & Co., contractors:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 8-inch | 612 | 2 | .... |
| 6-inch | 13 | 4 | .... |
| Total | 625 | 6 | 4 |

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Work done by Department men:

| Size of Main | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 20-inch | 263 | .... | .... |
| 12-inch | 530 | 1 | .... |
| 8-inch | 6,338 | 11 | .... |
| 6-inch | 2,487 | 45 | .... |
| Total | 9,618 | 57 | 45 |

Additional Hydrants—The work of setting additional hydrants on existing mains was continued during the year under the contract with Isaac Harris Company, dated August 23, 1906, which contract was assigned by them to John F. Mead on April 9, 1908. The work done under this contract was as follows.

| | |
|---|---|
| 6-inch pipe laid | 4,700 |
| 6-inch gates set | 712 |
| Additional hydrants set | 674 |
| Old hydrants replaced | 50 |

A contract was prepared and forwarded for approval and printing, for the setting of about 1,200 additional hydrants on distribution mains, mostly in the western and southern sections of the Borough, where they are specially needed.

Removal of Old Mains—Considerable work was done during the year in replacing old mains by new and larger mains. The pipe laying under the contract with the Interurban Construction Company, dated March 5, 1907, was completed on December 28, 1907, but the whole work, including the restoration of the pavements, was not completed until January 31, 1908. The final estimate was prepared and forwarded for payment on June 25, 1908; the total amount of work done under the contract was $233,868.32.

The work on the contract with James H. Holmes, dated October 9, 1907, which was discontinued on December 29, 1907, owing to the inclement weather, was resumed on March 18, 1908, on Oakland street, at the corner of Box street, and also on Provost street, at the corner of Greenpoint avenue. Such rapid progress was made by the contractor, that the work of pipe laying was completed on July 25, 1908. The whole work, including the restoring of the pavements, was completed on October 8, 1908. On November 16, the final estimate on the contract was forwarded for payment. The total amount of work done was $327,381.71.

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The work done during the year in replacing mains was as follows:

Contract for laying mains and removing existing mains in Bedford, Clinton, Greenpoint avenues, etc., James H. Holmes, contractor, dated October 9, 1907:

| Size of Main. | Linear Feet Laid. | Linear Feet Removed. | Gates Set. | Gates Removed. | Hydrants Set. | Hydrants. Removed. |
|---|---|---|---|---|---|---|
| 30-inch..... | 50 | 41 | 1 | .... | .... | .... |
| 24-inch..... | 10 | 10 | .... | .... | .... | .... |
| 20-inch..... | 6,630 | 95 | 18 | .... | .... | .... |
| 16-inch..... | 39,720 | 11 | 188 | .... | .... | .... |
| 12-inch..... | 7,717 | 165 | 66 | .... | .... | .... |
| 8-inch..... | 7,261 | 3,527 | 230 | 8 | .... | .... |
| 6-inch..... | 3,083 | 47,972 | 390 | 98 | .... | .... |
| Total..... | 64,471 | 51,821 | 893 | 106 | 385 | 90 |

During the year, two contracts were prepared and forwarded for approval and printing, for replacing the old mains in the following streets:

Evergreen avenue, from Flushing avenue to DeKalb avenue.

Lee avenue, from Flushing avenue to Division avenue.

Marcy avenue, from Park avenue to DeKalb avenue.

Sumner avenue, from Willoughby avenue to Broadway.

Roebling street, from Division avenue to Broadway.

Beaver street, from Flushing avenue to Myrtle avenue.

Bushwick avenue, from Decatur street to Myrtle avenue.

Lexington avenue, from Sumner avenue to Broadway.

Macon street, from Sumner avenue to Broadway.

Hopkinson avenue, from Atlantic avenue to Broadway.

Howard avenue, from Atlantic avenue to Broadway.

Reid avenue, from Macon street to Broadway.

Lewis avenue, from Macon street to Broadway.

Stuyvesant avenue, from DeKalb avenue to Broadway.

Sixth avenue, from Flatbush avenue to Twenty-fourth street.

Union street, from Fifth avenue to Eastern parkway.

Cropsey avenue, from Sixteenth avenue to Twenty-fourth avenue.

The plans for both the above contracts are in course of preparation.

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New Trunk Mains—The work on the contract for laying the new 16-inch main in Eighth, Eleventh, Coney Island avenues, etc., was completed on April 2, 1908. The final estimate on the contract has been prepared, but has not been forwarded for payment, pending the issue of the necessary certificates by the Bureau of Highways, as to the condition of the pavements. The total amount of work done under the contract was $46,888.25.

The pipe laid, etc., was as follows:

| Size of Main. | Linear Feet Laid. | Gates Set. | Hydrants Set. |
|---|---|---|---|
| 16-inch | 8,764 | 17 | .... |
| 12-inch | 37 | 5 | .... |
| 8-inch | 1,109 | 5 | .... |
| 6-inch | 683 | 65 | .... |
| Total | 10,593 | 92 | 39 |

Contract forms and specifications for two new 48-inch trunk mains were prepared and forwarded for printing. The first of these contracts is for a trunk main to provide additional supply for the Seventh, Twenty-third, Twenty-fifth and Twenty-sixth Wards. It contemplates the laying of a 48-inch main running from Crescent street and Glenmore avenue, where it will be connected to a branch of the 72-inch steel pipe line, through Glenmore avenue, Pennsylvania avnue, Bushwick avenue, Furman avenue, Sumpter street, Howard avenue and Madison street to Patchen avenue; thence a 36-inch main, through Madison street to Sumner avenue; thence a 30-inch main to Nostrand avenue; thence a 24-inch main to Classon avenue, where it will connect to the 20-inch main in said avenue. The second contract provides for a new supply main for the Eighth, Thirtieth, Thirty-first and Thirty-second Wards, and calls for the laying of a 48-inch main from the corner of East New York and Albany avenues, where it will be connected to the existing 48-inch main in East New York avenue, running through Albany avenue, Clarkson street, Woodruff avenue, Ocean avenue, Caxton avenue, Coney Island avenue, Church avenue and Fourteenth avenue to Thirty-fifth street; thence a 20-inch main through Fourteenth avenue to Fiftieth street; thence a 16-inch main through Fiftieth street to New Utrecht avenue, where it will connect to the 20-inch main in said avenue. The plans for both these contracts are in course of preparation.

Contract forms and specifications were prepared and forwarded for printing, for a new supply main for the Clinton avenue-Mount Prospect Reservoir District. This contract calls for the laying of a 24-inch main from Flatbush avenue, along Carlton avenue, Pacific street, Vanderbilt avenue and Atlantic avenue to Clinton avenue,

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connecting at Flatbush avenue with the 20-inch mains from Mount Prospect Reservoir and at Clinton avenue with the new 20-inch main in that avenue. The plans for this work have been completed.

Contract forms and specifications were prepared and forwarded for approval and printing for a new supply main for the Brooklyn Heights-Mount Prospect Reservoir district. This contract contemplates the laying of a 24-inch main, connecting with the 48-inch force main in Eastern parkway and running through Washington avenue, Sterling place, Fifth avenue, Flatbush avenue, Pacific street and Henry street to Pierrepont street, connecting to the 16-inch main in that street. The plans for this work have been completed.

Force Mains—Work on the contract for laying force mains and removing existing force mains at the Ridgewood Pumping Station, J. F. Mead, contractor, which was started during October, 1907, was continued throughout the winter. The work of cutting out and reconnecting the 48-inch force main running to the Mount Prospect Reservoir was done during January 11 and 12, 1908. The new connection between the 42-inch force main and the 36-inch force main from the Beam engine was completed on March 27. The work was then suspended, pending the completion of the foundations of the new pumping station building, which had to be in place before the 48-inch and 36-inch flanged force mains inside the building could be laid. These foundations were so far completed by the beginning of October, that the contractor was ordered to resume work on his contract. Work was resumed on October 17 and carried on continuously until completed on December 17. The final estimate on the contract is now being prepared. The pipe laid and gates set under the contract were as follows:

| Size of Main. | Linear Feet Laid. | Gates Set. | Check Valve Set. |
|---|---|---|---|
| 48-inch | 440 | 5 | 1 |
| 42-inch | 375 | .... | .... |
| 36-inch | 180 | 3 | .... |
| 30-inch | 277 | 1 | .... |
| 24-inch | 48 | 2 | .... |
| Total | 1,320 | 11 | 1 |

A requisition was issued to John F. Mead for cutting out and resetting the check valve on the 36-inch force main from the Beam engine at the north side Ridgewood station, so as to permit the construction of part of the new building. The work was started on March 30 and completed on April 1, 1908. The cost of the work was $860.

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On May 13, 1908, bids were received for laying the 30-inch cast-iron force main from the Titus plant at Forest Park, along Trotting Course lane and Myrtle avenue to the 48-inch main in Cypress avenue. The lowest bidders were Robert Carter & Co., and the amount of their bid $99,160.97. The contract was awarded to them, and it was signed on August 21. The contractors were ordered to begin work on August 31. The work of laying the pipe was commenced on October 1, and by the end of the year 15,073 linear feet of 30-inch pipe had been laid. The work on this contract is, practically, completed, except the setting of the 30-inch gates and the making of several blow-off connections.

Distribution System—Maintenance and Repairs.

The work of maintaining the distribution system in good condition and of repairing gates, hydrants, etc., was carried on regularly and systematically during the year. A great deal of special work, in the nature of setting new hydrants, eliminating dead ends on the mains, cross-connecting mains, setting new gates, etc., was done by the various repair yards.

The number of permits issued, taps driven and inspected, agreements signed and meters tested during the year, was as follows:

| | |
|---|---|
| Street opening permits | 3,339 |
| Extension permits | 254 |
| Old and new building permits | 1,706 |
| Cement sidewalk permits | 959 |
| Draw tap and plug permits | 233 |
| Special water permits | 80 |
| Taps driven and inspected | 3,681 |
| Private main agreements signed | 168 |
| New meters set | 1,673 |
| Old meters repaired and tested | 1,260 |
| Meters delivered to City plumber | 262 |

The large service connections made to mains during the year were as follows:

| | |
|---|---|
| 2-inch connections | 39 |
| 3-inch connections | 3 |
| 4-inch connections | 7 |
| 6-inch connections | 3 |
| 8-inch connection | 1 |
| Total | 53 |

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The work done by the gang assigned to the regular inspection, operation and repair of gates and hydrants was as follows:

| | |
|---|---|
| Regular hydrants repaired | 405 |
| High pressure hydrants repaired | 164 |
| High pressure hydrants operated | 705 |
| Gates on distribution mains repaired | 49 |
| Gates on distribution mains operated | 764 |
| High pressure gates repaired | 28 |
| High pressure gates operated | 589 |

The work done during the year by the Inspectors assigned to investigate complaints, etc., was as follows:

| | |
|---|---|
| Complaints of inadequate supply investigated | 202 |
| Complaints of waste of water investigated | 72 |
| Complaints of turbid water investigated | 46 |
| Complaints of defective hydrants investigated | 20 |
| Complaints of underground leaks investigated | 94 |
| Complaints of unlawful use of hose investigated | 9 |
| Miscellaneous complaints investigated | 526 |
| Total | 969 |

Some of the more important work done by the repair yards during the year is shown in the following table:

| | |
|---|---|
| 30-inch pipe laid, linear feet | 19 |
| 24-inch pipe laid, linear feet | 83 |
| 20-inch pipe laid, linear feet | 607 |
| 16-inch pipe laid, linear feet | 247 |
| 12-inch pipe laid, linear feet | 1,091 |
| 8-inch pipe laid, linear feet | 1,926 |
| 6-inch pipe laid, linear feet | 2,475 |
| Total | 6,448 |

| | |
|---|---|
| New fire hydrants set | 78 |
| Old hydrants replaced by new ones | 370 |
| Old hydrants replaced by good ones | 597 |
| Hydrants cleaned and oiled | 3,319 |
| Hydrants salted | 487 |
| Hydrants pumped and salted | 6,371 |

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| | |
|---|---|
| Hydrants thawed | 1,296 |
| New gates set | 230 |
| Old gates replaced by new ones | 64 |
| Gates repaired | 511 |
| Gates cleaned, oiled, etc | 381 |
| Gates tested | 247 |
| Leaks in mains repaired | 228 |

Table No. 13, attached hereto, shows the total number of mains laid during 1908, together with the mains laid previously. Table No. 15, shows the streets and limits in which water mains were laid during 1908.

Contracts--The following is a list of the contracts for work on the distribution system which were prepared during the year and forwarded for approval, printing and advertising:

For furnishing, delivering and laying water mains and appurtenances and removing existing water mains in Evergreen, Lee, Marcy and Sumner avenues, in Forrest and Roebling streets, etc.

For furnishing, delivering and laying water mains and appurtenances in Flatbush, Carlton, Vanderbilt, Atlantic avenues, etc.

For furnishing and delivering double nozzle hydrants.

For furnishing, delivering and laying water mains and appurtenances in Glenmore, Pennsylvania, Bushwick, Furman, Howard avenues, etc.

For hauling and laying water mains and appurtenances.

For furnishing and delivering cast iron pipe and special castings.

For furnishing, delivering and laying water mains and appurtenances in Albany, Woodruff, Ocean, Caton, Coney Island avenues, etc.

For furnishing, delivering and laying water mains and appurtenances and removing existing water mains in Bushwick, Cropsey, Hopkinson, Howard avenues, etc.

For furnishing, delivering and laying water mains and appurtenances in Flatbush, Fifth and Washington avenues, etc.

For furnishing, delivering and installing a draining apparatus on fire hydrants.

For furnishing and delivering valves.

The following is a list of the contracts for which bids were received, together with the names of the lowest bidders and the amounts of their bids:

April 1—For furnishing, delivering and laying an 8-inch water main and appurtenances in Grand street extension: Gallo, Tucillo & Pitelli, $3,838.77.

May 13—For furnishing, delivering and laying a 30-inch cast iron force main and appurtenances along Trotting Course lane and Myrtle avenue: Robert Carter & Co., $99,160.97.

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June 10—For hauling and laying water mains and appurtenances, District No. 1: Robert Carter & Co., $15,053.50.

June 10—For hauling and laying water mains and appurtenances, District No. 2: James Kelly, $13,993.50.

June 10—For hauling and laying water mains and appurtenances, District No. 3: Robert Carter & Co., $17,252.50.

June 10—For hauling and laying water mains and appurtenances, District No. 4: Robert Carter & Co., $16,465.25.

June 26—For furnishing and delivering stop-cocks: M. J. Drummond & Co., $33,125.

July 29—For furnishing and delivering cast iron stop-cock boxes and covers: John Fox & Co., $12,957.

August 26—For furnishing and delivering cast iron pipe and special castings: M. J. Drummond & Co., $42,360.

September 23—For furnishing and delivering double nozzle hydrants: The Kennedy Valve Manufacturing Company, $41,730.

High Pressure Fire Service System.

Coney Island System—There were received at the station during the year twenty-five alarms from the protected district, as follows:

January (2 alarms)—The average run of one pump on each alarm was ten minutes.

February (2 alarms)—Average run on one pump on each alarm was thirteen minutes.

March (1 alarm)—Average run of one pump was fifteen minutes.

April (1 alarm)—Average run of one pump, five minutes.

May (2 alarms)—Average run of one pump on each alarm was seven and one-half minutes.

June (5 alarms)—Average run of one pump on each alarm was eleven minutes.

July (4 alarms)—One of these, on July 9, was on a three-alarm fire at Pabst Loop; for this fire the three pumps were run together with salt water, for one hour and two minutes, and one pump was run for seven hours and eighteen minutes thereafter. On the other three alarms, ran one pump for an average period of eight minutes.

August (4 alarms)—Average run of one pump on each alarm was fourteen minutes.

September (1 alarm)—Average run of one pump was ten minutes.

November (2 alarms)—Average run of one pump on each alarm was five minutes.

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December (1 alarm)—Average run of one pump, thirteen minutes.

The electric wiring at the station has been changed so that the ignition current for running the gas engines is thrown onto the batteries automatically, should the Edison current service fail from any cause; new switchboards were installed during the year and the wiring brought up to date. Both the operation and appearance of the station have been materially improved thereby. During the year there was also installed at this station an automatic air compressor for charging the air tanks that are used in connection with the starting of the gas engines. This compressor enables each tank to be charged in five minutes; it starts charging the air tanks as soon as the air pressure drops below a fixed limit (120 pounds), and stops automatically when the pressure reaches 150 pounds. This is a decided improvement and adds to the reliability of the operation. The compressor is similar to those used for operating air brakes on electric cars and consists of a Westinghouse 6.35 horse-power, series wound 220-volt, 1,200 revolutions per minute, direct current motor, driving by means of a herring bone pinion and gear, a duplex single acting 5-inch by 3-inch horizontal air pump, mounted on a common bed plate.

The stamped steel covering of the roof of the station, which had badly corroded, was re-covered on the outside with asbestos slate and on the inside with asbestos lumber. This has added to the appearance and the fire-resisting qualities of the roof. The station building was also painted on the outside and inside during the year.

On October 4, 1907, an appropriation of $100,000 was granted by the Board of Estimate "for the construction and extension of the high pressure water service for fire and other purposes in the Coney Island section of the Borough of Brooklyn." Forms of contract and specifications for this work were prepared early in the year and forwarded for approval and printing. On October 28, 1908, bids were received, the lowest bidders being Murphy Brothers, and the amount of their bid $68,379.25. The contract was awarded to them and signed on November 21. The contractors were ordered to commence work on December 21, 1908. As soon as sufficient material has been manufactured and delivered on the ground, the work of pipe laying will be started. The contract provides for extending the system so as to embrace the section south of Surf avenue to West Twenty-eighth street; the section between Neptune avenue and Surf avenue, from West Fifth street to West Eighteenth street, and Sea Breeze avenue. It also provides for the setting of three permanent "Morse" nozzles on Ocean avenue, and for repairs to the salt water intake at the station.

## Main System.

Building, Reserve Station—This building was entirely completed early in the year. The final estimate on the contract for the work, amounting to $45,881, was forwarded for payment on April 20, 1908.

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Building, Main Station—The erection of this building was entirely completed on November 1, 1908. The final estimate on the contract was prepared and forwarded for payment on December 4, 1908. The total cost of the work was $66,562.75.

Equipment, Reserve Station—The equipment in this station was completed on January 31, 1908, but, on trial, it was found that the motors were overloaded when the pressure on the pumps were reduced below 300 pounds per square inch. Since the Fire Department were not prepared at that time to handle the high pressure, and as the specifications for the pumps provided for just this emergency, the contractors proceeded to install pressure regulating valves on the delivery from each pump. By means of these valves, any desired pressure can be maintained on the pipe system, irrespective of the varying amounts of water discharged, while the pumps are operating against a pressure of 300 pounds per square inch or over. The installation of these valves was completed on March 31, 1908. Several tests of the equipment were then held, which proved that the water could be delivered at the extreme ends of the system in the volumes and pressures claimed when the system was designed; in fact, the actual results have been better. The equipment was officially tested on May 16 and 17 by Professor Albert F. Ganz, M. E., the expert appointed by the Commissioner to conduct the test. Professor Ganz was assisted by Professor E. L. Pryor, M. E. Previously, in April, 1907, the 800 horsepower 3-phase 6,000-volt induction motors had been tested at the works of the General Electric Company, under the supervision of Professor George F. Sever, Consulting Electrical Engineer of the Department. The results of the tests carried out by Professor Sever are shown in the following extracts from his report:

"As a result of the test made in April, 1907, I find that the full load efficiency is 95 per cent. and the power factor 96 per cent., as against the specifications, which call for not less than 92 per cent. and not less than 93 per cent., respectively, thus showing that in these respects the motors are entirely satisfactory. The slip called for in the specifications must not exceed 2 per cent., whereas, in the test, this amount was not exceeded. At three-quarter load the efficiency is 95 per cent., as against 92 per cent. in the specifications, and the power factor is 95½ per cent. as against 90 per cent. in the specifications, and the slip does not exceed 1½ per cent. Thus, at three-quarter load, the specifications are fully complied with and indicate that the motors are satisfactory at this portion of the load. I find that the last test shows that after twenty-four hours continuous run at full rated load the maximum rise in temperature is not over 35 degrees C., while at the end of the two hours run, at 25 per cent. overload, the maximum rise is not over 45 degrees C. Both of these values are well within the limits set by the specifications."

The results of the official test are shown in the following summary in the report of Professors Ganz and Pryor:

"Endurance—The three motors and pumps operated satisfactorily at full or overload for twenty-four hours without a single shut down.

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"Capacity—The combined capacity of the three motor pumps was 9,800 gallons per minute at 300 pounds net pressure, or 9,000 gallons per minute at 318 pounds net pressure.

"Efficiency—The average efficiency developed by the three pumps during the best eight hours operating together and delivering 9,000 gallons per minute at 318 pounds net pressure was 67.5 per cent.

"We desire to note that, whereas the full load efficiency of the pumps is 2½ per cent. less than called for in the specifications, the full load efficiency of the motors, as reported by Professor Sever, is 3 per cent. higher than called for in the specifications. The combined efficiency of the motor and pump as tested is 67.5 per cent. by 95 per cent., equal to 64.13 per cent., and the combined efficiency calculated from the specification figures is 70 per cent. by 92 per cent., equal to 64.40 per cent.

"Heat Test—After continuous operation for twenty-four hours at full or overload, the maximum temperature rise of any part of any motor was 37 degrees C. above the surrounding air, which is within the limit of 40 degrees C. allowed by the specifications.

"Starting Test—The motors could be started and brought to full speed, when started under service conditions, within less than 45 seconds with a starting current less than 150 per cent. of full load current, as required by the specifications. The motors could also be satisfactorily started at five minute intervals, as required.

"Pressure Regulation—The pressure in the distribution mains could be maintained constant at any previously adjusted point between 100 and 300 pounds for varying rates of delivery of water and without overloading the motors, provided that an operator was stationed at each set of valves to manually keep the valves in proper adjustment. Without constant attention the regulating valves would not obtain an equal distribution of load between motors when two or three motor pumps were operating together.

"Each set of regulating valves is at present located close to its pump. If these valves should be brought together at one point it may be possible that one operator can maintain the adjustment of all three sets of valves. Whether or not this can be done we cannot state without trial.

"General Remarks—The voltage of the supply during the test was maintained within the limits, 6,000 and 6,300 volts, as called for by the specifications. The speed of the motors during this time was also substantially that required by the specifications.

"The general arrangement of the entire plant is excellent and well suited for its purpose. The operation was in every respect satisfactory, and the ease of manipulation and absence of vibration were especially noticeable."

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The following tables show the results of the above tests in detail:

TABLE 1.

Results of Efficiency Tests of Three Worthington Six-Stage Centrifugal Pumps Motor-Driven, May 16, 17, 1908.

(Made at Reserve High Pressure Fire Service Station at Willoughby and St. Edwards Streets, Borough of Brooklyn.)

| Number of Test. | Time of Test. | Duration of Test, in Hours and Minutes. | Water Delivered, Gallons Per Minute. | Average Pressures Developed by Pumps in Pounds Per Sq. In. | Horse Power Output from Pumps. | Horse Power Input Into Pumps. | Efficiencies in Per Cent. |
|---|---|---|---|---|---|---|---|
| 1. | 2.05—10.05 p. m. | 8—00 | 9,841.3 | 300.8 | 1,727.3 | 2,572.2 | 67.2 |
| 2. | 10.05—12.05 a. m. | 2—00 | 9,450.0 | 310.2 | 1,710.7 | 2,543.6 | 67.3 |
| 3. | 12.05— 8.05 a. m. | 8—00 | 9,056.1 | 318.6 | 1,683.4 | 2,493.7 | 67.5 |
| 4. | 8.20— 9.20 a. m. | 1—00 | 10,754.4 | 290.0 | 1,819.8 | 2,758.5 | 66.0 |
| 5. | 9.35—10.35 a. m. | 1—00 | 8,676.3 | 327.5 | 1,658.6 | 2,467.5 | 67.2 |
| 6. | 10.50—11.20 a. m. | 0—30 | 7,988.8 | 339.1 | 1,580.6 | 2,363.3 | 66.9 |
| 7. | 11.20—12.05 p. m. | 0—45 | 9,891.7 | 308.3 | 1,779.7 | 2,659.7 | 66.9 |
| 8. | 12.05—12.50 p. m. | 0—45 | 8,666.7 | 331.3 | 1,675.5 | 2,490.7 | 67.3 |
| 9. | 12.50— 1.35 p. m. | 0—45 | 8,316.7 | 337.8 | 1,639.4 | 2,442.7 | 67.1 |

TABLE 2.

Hourly Averages for Two Eight Hour Efficiency Tests of Three Worthington Six-Stage Centrifugal Pumps, Motor Driven, May 16, 1908.

(Made at Reserve High Pressure Fire Service Station at Willoughby and St. Edwards Streets, Borough of Brooklyn.)

*Test Under 300 Pounds Pressure and 9,800 Gallons per Minute Capacity.*

| Time of Test. | Water Delivered, Gallons Per Minute. | Average Pressures Developed by Pumps, Pounds Per Square Inch. | Horse Power Output from Pumps. | Horse Power Input Into Pumps. | Efficiencies in Per Cent. |
|---|---|---|---|---|---|
| 2.05— 3.05 p. m..... | 9,887.5 | 299.1 | 1,725.5 | 2,579.8 | 66.9 |
| 3.05— 4.05 p. m..... | 9,938.8 | 300.4 | 1,742.3 | 2,599.0 | 67.0 |
| 4.05— 5.05 p. m..... | 9,831.3 | 302.2 | 1,733.8 | 2,587.0 | 67.0 |
| 5.05— 6.05 p. m..... | 9,947.5 | 301.4 | 1,749.3 | 2,609.3 | 67.0 |
| 6.05— 7.05 p. m..... | 9,901.3 | 301.3 | 1,740.7 | 2,587.8 | 67.3 |
| 7.05— 8.05 p. m..... | 9,675.0 | 302.2 | 1,705.8 | 2,531.3 | 67.4 |
| 8.05— 9.05 p. m..... | 9,755.0 | 300.1 | 1,708.3 | 2,527.5 | 67.6 |
| 9.05—10.05 p. m..... | 9,793.8 | 299.7 | 1,712.8 | 2,556.0 | 67.0 |
| Average..... | 9,841.3 | 300.8 | 1,727.3 | 2,572.2 | 67.2 |

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*Test Under 9,000 Gallons per Minute Capacity and 318 Pounds Pressure.*

| Time of Test. | Water Delivered, Gallons Per Minute. | Average Pressures Developed by Pumps, Pounds Per Square Inch. | Horse Power Output from Pumps. | Horse Power Input Into Pumps. | Efficiencies in Per Cent. |
|---|---|---|---|---|---|
| 12.05— 1.05 a. m..... | 9,096.3 | 319.2 | 1,694.0 | 2,502.8 | 67.7 |
| 1.05— 2.05 a. m..... | 8,941.3 | 316.6 | 1,652.1 | 2,429.3 | 68.0 |
| 2.05— 3.05 a. m..... | 8,981.3 | 320.0 | 1,676.8 | 2,485.3 | 67.5 |
| 3.05— 4.05 a. m..... | 9,038.8 | 317.0 | 1,672.1 | 2,483.8 | 67.3 |
| 4.05— 5.05 a. m..... | 9,265.0 | 318.3 | 1,720.8 | 2,542.0 | 67.7 |
| 5.05— 6.05 a. m..... | 8,936.3 | 317.6 | 1,655.9 | 2,465.3 | 67.2 |
| 6.05— 7.05 a. m..... | 8,938.8 | 318.4 | 1,660.7 | 2,463.5 | 67.4 |
| 7.05— 8.05 a. m..... | 9,251.3 | 321.3 | 1,734.4 | 2,577.5 | 67.3 |
| Average..... | 9,056.1 | 318.6 | 1,683.4 | 2,493.7 | 67.5 |

TABLE 3.

Temperature Rise of Motor Parts Based on a Room Temperature of 27 Degrees C., Average.

| | Temperature Rise, C°. | | |
|---|---|---|---|
| | Motor No. 1. | Motor No. 2. | Motor No. 3. |
| Stator winding, slip ring end, right..... | 34 | 37 | 31 |
| Stator winding, slip ring end, left..... | 36 | 36 | 33 |
| Stator winding, pump end, right..... | 29 | 33 | 24 |
| Stator winding, pump end, left..... | 28 | 34 | 24 |
| Stator core..... | 22 | 21 | 30 |
| Rotor winding, binding wire..... | 36 | 37 | 36 |
| Rotor winding, inner drum surface..... | 31 | 32 | 28 |
| Rotor winding, end connections..... | 32 | 34 | 30 |
| Bearing, slip ring end, top..... | 28 | 23 | 22 |
| Bearing, slip ring end, oil..... | 26 | 26 | 21 |
| Bearing, pump end, top..... | 21 | 17 | 13 |
| Frame ..... | 14 | 15 | 12 |

As the combined efficiency of the motor pump units was practically what the specifications called, for it was recommended that the work be accepted. It was so accepted and the final estimate on the contract was prepared and forwarded for payment on November 20, 1908. The total cost of the work was $63,264.16.

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Subsequent to the test, the pilot valves operating the pressure regulating valves were grouped together and their operation tested. It has been found that one operator can maintain the adjustment of the three sets of valves satisfactorily.

On May 25, 1908, the Fire Department was notified that the reserve station was ready to respond to alarms and the station was held in readiness to answer any emergency demands upon it, while waiting for official notice from the Fire Department. The fire mains, in the meanwhile, were connected with the distribution system by means of two temporary connections, so that the high pressure hydrants could be used in case of fire at distribution pressure. Upon a verbal notice from Deputy Chief Thomas Lally of the Fire Department that they were ready to utilize the system, the station was placed into regular fire service on September 21, 1908. The temporary connections between the fire mains and the distribution system were taken out so as to obviate the possible danger of forcing salt water into the distribution mains.

In October this station responded to eight alarms, emanating from the "Reserve" protected district. The durations of the runs varied from 4 minutes to 22 minutes, the average being 9 minutes. The maximum rate of delivery never exceeded 500 gallons per minute, and the pressures on the fire lines varied between 75 and 100 pounds per square inch.

In November the station responded to seven alarms; the duration of run at six of these alarms varied from 4 minutes to 44 minutes, with an average run of 13 minutes. On November 12 the station responded to a three-alram fire at the Park Theatre, opposite Borough Hall; two pumps were run for 1 hour and 50 minutes and one pump for 2 hours and 9 minutes longer. The maximum rate of delivery was 3,600 gallons per minute, the maximum pressure 150 pounds per square inch and the total amount of water used at the fire was approximately 200,000 gallons.

In December the station responded to twelve alarms; the duration of run varied from 2 minutes to 23 minutes, with an average run of 8 minutes. The maximum rate of delivery did not exceed 600 gallons per minute.

Equipment, Main Station—The equipment in this station was practically completed on September 10, 1908; a delay of a month was caused through a disagreement between the contractors and the firm furnishing the pressure regulating valves, two of these valves not having been installed until the above date. The contractors commenced the thirty-day period of operation, called for in the contract, on September 21, on which date the station was put into regular fire service. The induction motors for this station were, like those for the reserve station, tested by Professor Sever at the shops. The following are extracts from his report on said test:

"As a result of the test made in April, I find that the full load efficiency is 95 per cent. and the power factor 96 per cent., as against the specifications which call for not less than 92 per cent and not less than 93 per cent., respectively, thus showing that in these respects the motors are entirely satisfactory. The slip called for in the

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specifications must not exceed 2 per cent., whereas, in the test this amount was not exceeded.

"At three-quarter load the efficiency is 95 per cent. as against 92 per cent., in the specifications and the power factor is 95½ per cent. as against 90 per cent., in the specifications, and the slip does not exceed 1½ per cent. Thus at three-quarter load the specifications are fully complied with and indicate that the motors are satisfactory at this portion of the load. I find that the last test shows that after 24 hours' continuous run at full rated load the maximum rise in temperature is not over 35 degrees C., while at the end of the two hours' run at 25 per cent. overload the maximum rise is not over 45 degrees C. Both of these values are well within the limits set by the specifications."

The completed equipment was tested by Professors Ganz and Pryor on November 14 and 15. The results of the tests are summarized in their report, as follows:

"Endurance—The five motor-pump units delivered salt water at full or overload for 24 hours without a single shut-down, and the operation of the motors and the pumps was in every way satisfactory.

"Capacity—The combined capacity of the five motor-pump units was 15,780 gallons of salt water per minute at 300 pounds delivery pressure, or 15,000 gallons of salt water per minute at 306.7 pounds delivery pressure.

"Efficiency—The average efficiency developed by the five pumps during the best eight hours operating together and delivering 15,780 gallons of salt water per minute at 300 pounds delivery pressure was 66.3 per cent.

"We desire to note that, whereas, the full load efficiency of the pumps is 3.7 less than called for in the specifications, the full load efficiency of the motors, as reported by Professor Sever, is 3 per cent. higher than called for in the specifications. The combined efficiency of the motors and pumps as tested is 66.3 per cent. by 95 per cent. = 63.0 per cent., and the combined efficiency calculated from the specification figures is 70 per cent. by 92 per cent. = 64.4 per cent.

"Heat Test—After the continuous operation for 24 hours at full or over load, the maximum temperature rise of any part of any motor was 38° C., above the surrounding air, which is within the limit of 40° C. allowed by the specifications. Also during the 24-hour test no stationary part of any motor rose more than 40° in temperature above the surrounding air.

"Starting Test—The motor pump units could be started under service conditions within less than 45 seconds, and with a starting current less than 150 per cent. of full load current, as required by the specifications. Each motor could also be satisfactorily started at five-minute intervals as required.

"Pressure Regulation—With no more than three units operating together, the pressure in the distributing mains can be maintained constant at any previously ad-

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justed point between 100 and 300 pounds for varying rates of delivery of water, without overloading any of the motors, provided that an experienced operator is stationed at the valves to manually keep them in proper adjustment. With more than three units in operation, an experienced operator may be able to maintain any required pressure on the delivery main, but cannot prevent overloading some of the motors. An additional operator could not overcome this difficulty.

"General Remarks—The same general statement regarding the general equipment can be made as in the case of the Reserve Station, namely, that the general arrangement of the plant is excellent and well suited for its purpose. The control of the operation of the motors and pumps is also in every respect satisfactory. The absence of vibration and the ease of manipulation were also especially noticeable."

The following tables show the results of the tests in detail:

TABLE No. 1.

Results of Efficiency Tests of Five Worthington, Six-stage, Centrifugal Pumps, Motor Driven, November 14, 15, 1908.

(Main High Pressure Fire Service Station at Furman and Joralemon Streets, Borough of Brooklyn.)

| No. of Test | Time of Test. | Duration of Test in Hours and Minutes. | Water Delivered. Per Gallons Minute. | Average Pressures Developed by Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Suction (Vacuum). | Delivery. | Net. | | | |
| 1.... | 8.15 A. M.- 4.15 P. M. | 8.0 | 15,780 | 9.6 | 300.3 | 309.9 | 2,852 | 4,302.8 | 66.3 |
| 2.... | 4.15 P. M.-12.15 A. M. | 8.0 | 15,020 | 9.7 | 306.7 | 316.4 | 2,772 | 4,201.0 | 66.0 |
| 3.... | 12.15 A. M.- 1.45 P. M. | 1.30 | 16,440 | 9.4 | 291.3 | 300.7 | 2,884 | 4,391.3 | 65.7 |
| 4.... | 1.45 A. M.- 3.00 A. M. | 1.15 | 17,040 | 9.9 | 281.5 | 291.4 | 2,897 | 4,455.8 | 65.0 |
| 6.... | 3.30 A. M.- 3.50 A. M. | 0.20 | 16,475 | 10.3 | 250.4 | 260.7 | 2,506 | 4,286.0 | 58.5 |
| 7.... | 3.50 A. M.- 4.05 A. M. | 0.15 | 16,205 | 10.2 | 225.9 | 236.1 | 2,232 | 4,208.0 | 53.0 |
| 8.... | 4.05 A. M.- 5.30 A. M. | 1.25 | 13,645 | 9.3 | 321.0 | 330.3 | 2,629 | 4,006.8 | 65.6 |
| 9.... | 5.30 A. M.- 7.00 A. M. | 1.30 | 12,962 | 9.3 | 331.1 | 340.4 | 2,574 | 3,966.8 | 64.9 |
| 10.... | 7.00 A. M.- 8.15 A. M. | 1.15 | 13,962 | 9.4 | 321.2 | 330.6 | 2,693 | 4,105.0 | 65.6 |

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TABLE No. 2.

Hourly Averages for Two Eight-hour Efficiency Tests of Five Worthington, Six-stage Centrifugal Pumps, Motor Driven, November 14, 15, 1908.

(Main High Pressure Fire Service Station at Furman and Joralemon Streets, Borough of Brooklyn.)

*Test Under* 300 *Pounds Delivery Pressure.*

| Time of Test. | Water Delivered Gallons Per Minute. | Average Pressures Developed By Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|
| | | Suction (Vacuum). | Delivery. | Net. | | | |
| 8.15 A. M.- 9.15 A. M. | 15,938 | 10.6 | 301.5 | 312.1 | 2,900 | 4,333.5 | 66.9 |
| 9.15 A. M.-10.15 A. M. | 15,831 | 10.3 | 300.0 | 310.3 | 2,866 | 4,306.3 | 66.6 |
| 10.15 A. M.-11.15 A. M. | 15,739 | 9.5 | 300.5 | 310.0 | 2,846 | 4,289.0 | 66.4 |
| 11.15 A. M.-12.15 P. M. | 15,840 | 8.9 | 300.6 | 309.5 | 2,860 | 4,333.3 | 66.0 |
| 12.15 P. M.- 1.15 P. M. | 15,950 | 9.0 | 299.9 | 308.9 | 2,874 | 4,344.0 | 66.2 |
| 1.15 P. M.- 2.15 P. M. | 15,805 | 9.1 | 299.7 | 308.8 | 2,848 | 4,306.8 | 66.1 |
| 2.15 P. M.- 3.15 P. M. | 15,658 | 9.4 | 300.3 | 309.7 | 2,828 | 4,268.3 | 66.3 |
| 3.15 P. M.- 4.15 P. M. | 15,483 | 9.8 | 300.2 | 310.0 | 2,800 | 4,241.5 | 66.0 |
| Average..... | 15,780 | 9.6 | 300.3 | 309.9 | 2,852 | 4,302.8 | 66.3 |

*Test Under* 15,000 *Gallons Per Minute Capacity.*

| Time of Test. | Water Delivered Gallons Per Minute. | Average Pressures Developed By Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|
| | | Suction (Vacuum). | Delivery. | Net. | | | |
| 4.15 P. M.- 5.15 P. M. | 14,955 | 9.8 | 304.2 | 314.0 | 2,739 | 4,132.8 | 66.3 |
| 5.15 P. M.- 6.15 P. M. | 15,025 | 10.0 | 306.7 | 316.7 | 2,776 | 4,191.6 | 66.2 |
| 6.15 P. M.- 7.15 P. M. | 15,003 | 10.0 | 307.4 | 317.4 | 2,779 | 4,206.3 | 66.1 |
| 7.15 P. M.- 8.15 P. M. | 14,968 | 10.0 | 305.9 | 315.9 | 2,757 | 4,186.8 | 65.8 |
| 8.15 P. M.- 9.15 P. M. | 14,995 | 9.9 | 305.3 | 315.2 | 2,757 | 4,184.5 | 65.9 |
| 9.15 P. M.-10.15 P. M. | 15,008 | 9.5 | 305.4 | 314.9 | 2,756 | 4,182.8 | 65.9 |
| 10.15 P. M.-11.15 P. M. | 15,225 | 9.5 | 307.4 | 316.9 | 2,814 | 4,273.3 | 65.8 |
| 11.15 P. M.-12.15 P. M. | 14,980 | 9.1 | 311.4 | 320.5 | 2,800 | 4,250.3 | 65.9 |
| Average..... | 15,020 | 9.7 | 306.7 | 316.4 | 2,772 | 4,201.0 | 66.0 |

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TABLE No. 3.

Hourly Averages of Two Efficiency Tests of Two Worthington, Six-stage Centrifugal Pumps, Motor Driven, November 14, 15, 1908.

(Main High Pressure Fire Service Station at Furman and Joralemon Streets, Borough of Brooklyn.)

*Test Under 300 Pounds Delivery Pressure.*

| Time of Test. | Water Delivered Gallons Per Minute. | Average Pressures Developed By Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|
| | | Suction (Vacuum). | Delivery. | Net. | | | |
| 8.15 A. M.- 9.15 A. M. | 6,463 | 11.1 | 301.5 | 312.6 | 1,178 | 1,730.5 | 68.1 |
| 9.15 A. M.-10.15 A. M. | 6,353 | 10.5 | 299.9 | 310.4 | 1,150 | 1,711.8 | 67.2 |
| 10.15 A. M.-11.15 A. M. | 6,265 | 9.5 | 300.2 | 309.7 | 1,131 | 1,700.5 | 66.5 |
| 11.15 A. M.-12.15 P. M. | 6,303 | 8.9 | 300.1 | 309.0 | 1,136 | 1,716.8 | 66.2 |
| 12.15 P. M.- 1.15 P. M. | 6,380 | 9.2 | 300.0 | 309.2 | 1,151 | 1,719.3 | 66.9 |
| Average..... | 6,351 | 9.8 | 300.4 | 310.2 | 1,149 | 1,715.6 | 67.0 |

*Test Under 6,000 Gallons Per Minute Capacity.*

| Time of Test. | Water Delivered Gallons Per Minute. | Average Pressures Developed By Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|
| | | Suction (Vacuum). | Delivery. | Net. | | | |
| 7.15 P. M.- 8.15 P. M. | 5,990 | 10.3 | 304.4 | 314.7 | 1,099 | 1,660.5 | 66.2 |
| 8.15 P. M.- 9.15 P. M. | 6,000 | 10.2 | 303.9 | 314.1 | 1,100 | 1,668.5 | 65.9 |
| 9.15 P. M.-10.15 P. M. | 5,990 | 9.9 | 304.9 | 314.8 | 1,100 | 1,664.0 | 66.1 |
| 10.15 P. M.-11.15 P. M. | 6,018 | 9.8 | 308.1 | 317.9 | 1,115 | 1,692.0 | 65.9 |
| 11.15 P. M.-12.15 A. M. | 5,963 | 9.4 | 311.5 | 320.9 | 1,116 | 1,686.0 | 66.2 |
| Average..... | 5,992 | 9.9 | 306.6 | 316.5 | 1,106 | 1,674.2 | 66.1 |

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TABLE No. 4.

Hourly Averages of Two Efficiency Tests of Three Worthington, Six-stage, Centrifugal Pumps, Motor Driven, November 14, 15, 1908.

(Main High Pressure Fire Service Station, at Furman and Joralemon Streets, Borough of Brooklyn, Pumps 2, 4 and 5.)

*Test Under 300 Pounds Delivery Pressure.*

| Time of Test. | Water Delivered Gallons Per Minute. | Average Pressures Developed By Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|
| | | Suction (Vacuum). | Delivery. | Net. | | | |
| 8.15 A. M.- 9.15 A. M. | 9,475 | 10.3 | 301.5 | 311.8 | 1,722 | 2,603.0 | 66.2 |
| 9.15 A. M.-10.15 A. M. | 9,479 | 10.1 | 300.1 | 310.2 | 1,716 | 2,594.5 | 66.1 |
| 10.15 A. M.-11.15 A. M. | 9,474 | 9.5 | 300.7 | 310.2 | 1,714 | 2,588.5 | 66.2 |
| 11.15 A. M.-12.15 P. M. | 9,538 | 9.0 | 300.8 | 309.8 | 1,724 | 2,616.5 | 65.9 |
| 12.15 P. M.- 1.15 P. M. | 9,597 | 8.9 | 299.8 | 308.7 | 1,727 | 2,624.3 | 65.8 |
| Average..... | 9,508 | 9.7 | 300.6 | 310.3 | 1,721 | 2,604.4 | 66.1 |

*Test Under 9,000 Gallons Per Minute Capacity.*

| Time of Test. | Water Delivered Gallons Per Minute. | Average Pressures Developed By Pumps in Pounds Per Square Inch. | | | Horse-Power Output From Pumps. | Horse-Power Input Into Pumps. | Efficiency in Per Cent. |
|---|---|---|---|---|---|---|---|
| | | Suction (Vacuum). | Delivery. | Net. | | | |
| 7.15 P. M.- 8.15 P. M. | 8,979 | 9.7 | 306.9 | 316.6 | 1,658 | 2,526.3 | 65.6 |
| 8.15 P. M.- 9.15 P. M. | 8,995 | 9.6 | 306.2 | 315.8 | 1,656 | 2,516.0 | 65.8 |
| 9.15 P. M.-10.15 P. M. | 9,018 | 9.3 | 305.7 | 315.0 | 1,656 | 2,518.8 | 65.7 |
| 10.15 P. M.-11.15 P. M. | 9,208 | 9.3 | 306.9 | 316.2 | 1,698 | 2,581.3 | 65.8 |
| 11.15 P. M.-12.15 A. M. | 9,018 | 8.9 | 311.4 | 320.3 | 1,684 | 2,564.3 | 65.7 |
| Average..... | 9,043 | 9.4 | 307.4 | 316.8 | 1,670 | 2,541.3 | 65.7 |

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TABLE No. 5.

Temperature Rise of Motor Parts at End of Twenty-four-hour Endurance Test Based on Average Room Temperature of Twenty-seven Degrees Centigrade.

| Motor Parts. | Temperature Rise, Centigrade Degrees. | | | | |
|---|---|---|---|---|---|
| | Motor No. 1. | Motor No. 2. | Motor No. 3. | Motor No. 4. | Motor No. 5. |
| Bearing—Slip-ring end, top..... | 22 | 24.5 | 23 | 22 | 28 |
| Bearing—Slip-ring end, oil..... | 22 | 24.5 | 23 | 21 | 24.5 |
| Bearing—Pump end, top..... | 13 | 21 | 12 | 21 | 13 |
| Stator Winding—Slip-ring end, right..... | 36 | 35.5 | 33 | 34.5 | 34 |
| Stator Winding—Slip-ring end, left..... | 38 | 37.5 | 36.5 | 35 | 36.5 |
| Stator Winding—Pump end, right..... | 30.5 | .. | 31.5 | 29 | 31 |
| Stator Winding—Pump end, left..... | .. | 29 | .. | .. | .. |
| Rotor Winding—Slip-ring end, binding wire... | 31.5 | 21 | 30.5 | 20 | 30 |
| Rotor Winding—Slip-ring end, end connections | 31 | 32 | 31 | 28 | 30 |
| Rotor Winding—Pump end, end connections... | 27 | .. | .. | .. | .. |
| Rotor Winding—Slip-ring end, core..... | 24 | 17.5 | 18.5 | 13 | 23 |
| Rotor Winding—Slip-ring end, winding..... | 30 | 35.5 | 30.5 | 32 | 30 |

The pumps having failed to comply with the specifications, they have not as yet been accepted. It is provided in the specifications that if either the pumps and motors fail, under test, to meet the requirements, they shall be rejected, unless the contractor avails himself of the option given to him to demand a second test, in which case said second test shall be granted, and the contractor allowed thirty working days to make any alterations to the pumps or motors before the second test. It is also provided that should the motors or pumps fail to pass the second test in accordance with the requirements of the specifications, such motors or pumps shall be rejected, and the contractor shall replace the rejected parts of the equipment within 150 working days, allowing the City to use the old equipment until so replaced. It was recommended that the contractors avail themselves of said option; they have notified the Department that they wish to do so, and have already started the work of altering the pumps. Meanwhile the equipment is continued in regular service.

The station responded to six alarms in October, to eight alarms in November and to eleven alarms in December. The duration of the runs varied from five minutes to forty-eight minutes; the maximum pressure required was 100 pounds, and the maximum rate of delivery was 1,800 gallons per minute. On November 20, 1908, a cave-in of the sewer being constructed on Gold street cut off all the feeders of the Edison Electric Illuminating Company that radiated from their Gold street power house, and both the high pressure stations were without current for one hour

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and fifteen minutes. In order to obviate a possible repetition of this occurrence, the Edison Company will install separate feeders to each station from their Sixty-sixth street generating station, in addition to the present connections through the Gold street power house.

Agreement with the Fire Department—On November 18, 1908, an agreement was entered into with the Fire Department relative to the operation of the high pressure fire service system. The main features of this agreement are that each of the three stations will respond to an alarm emanating from its district immediately upon receipt of same, and put on initial pressure of 75 pounds on the system in the main and reserve districts, and 150 pounds in the Coney Island district; that the Fire Department will direct the Enginemen at the stations, by means of the high pressure telephone service, how the pressure is to be regulated, and when the service of the pumps is no longer required; that during the progress of a fire, the Enginemen at the stations shall remain under the orders of the Fire Department (see Appendix I.).

Rules and Regulations—A complete and comprehensive set of rules and regulations for the government of all employees in the operation of the high pressure fire service stations has been drawn up and are now being printed in book form. As soon as they are printed, a copy will be given to each of the employees at the stations. These rules are very similar to those issued by large power generating and railroad companies (see Appendix II.).

Private Telephone Service—For controlling the operation of the two stations in the main and reserve districts, a private telephone system has been installed. This consists of a switchboard at each station; to the swithcboard at the main station are wired sixty-one telephone call boxes, and to the switchboard at the reserve station, sixty such boxes. These private telephone boxes are located near the fire alarm signal boxes, not more than six on a circuit, and these scattered so that in case a circuit should get out of order, the boxes affected thereby shall be scattered over distant blocks. There is an extension telephone station connected to each switchboard, current supply wires from the switchboard to the central office of the New York and New Jersey Telephone Company, a reserve machine at each station to furnish current on emergency, a private tie line between the two switchboards, a central office line from each switchboard to "Central," a private tie line from each switchboard to the office of the Edison Electric Illuminating Company, and a private tie line between each switchboard and Fire Headquarters. For this service, including the privilege of 3,600 local messages per year from each station, the City pays the New York and New Jersey Telephone Company $4,243.50.

Emergency Operating Switchboards—There have been installed in the office of the reserve station and in the office and on the pump room floor of the main station, emergency boards, from each of which any of the high tension oil switches can be opened (but not closed) by means of a pull switch. The purpose of these auxiliary

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boards is to enable the operator to shut down any machine or disconnect any feeder in case of emergency, should he have no access to the main operating switchboard. At the main station, where the main board is on a gallery, it also releases the man starting up a machine to work on the pump room floor after the machine is up to speed.

Salt Water Suction Mains—Bids for the work of laying the salt water suction mains for the main station at Furman and Joralemon streets were received on January 22, 1908. The lowest bidders were the Phoenix Construction Company, and the amount of their bid was $24,898. The contract was awarded to them, and they were ordered to begin work on April 6, 1908. The work was entirely completed on September 8, 1908. The pipe laid, etc., under the contract was as follows: 1,782 linear feet of 24-inch pipe laid; 3 24-inch foot valves set; 1 pump well built and set in place; 400 feet of intake built and set in place; 1 intake well built and set in place.

The final estimate on the contract was prepared and forwarded for payment in September.

The total amount of work done was $24,471.07.

Traveling Cranes—Bids for the work of installing hand traveling cranes at the high pressure stations were received on January 22, 1908. The Cleveland Crane and Car Company were the lowest bidders, and the amount of their bid was $3,520. The contract was awarded to them, and they were directed to commence work on April 13, 1908. The installation of the cranes was entirely completed on June 30. The final estimate on the contract was prepared and forwarded for payment on July 1. The total cost of the work was $3,520. These cranes are of 10-ton capacity, and each can bear the weight of one 800-horsepower induction motor, complete. Their installation has proven of great benefit in expediting the handling of parts of the equipment, especially at the main station.

Extension of System—Considerable work was done during the year upon the preparation of plans and specifications for, and estimates of cost of, extending the present high pressure system to Greenpoint on the north and to Sixtieth street on the south, and including the Gowanus Canal district; also for a high pressure line on Livingston street, from Court street to Flatbush avenue. Nothing further has been done in this matter, however, pending the granting of the appropriation necessary for the work.

Contracts—The following contracts for work on the high pressure fire service system were prepared during the year and forwarded for approval and printing:

For extending and improving the high pressure fire service system at Coney Island.

For furnishing, delivering and erecting automatic registering and time recording apparatus at the main and reserve high pressure fire service stations.

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The following are the contracts for which bids were received, together with the names of the lowest bidders and the amounts of their bids:

January 22—For furnishing, delivering and installing hand traveling cranes at the high pressure fire service stations: Cleveland Crane and Car Company, $3,520.

January 22—For furnishing, delivering and laying the salt water intake and suction mains for the high pressure fire service station at Furman and Joralemon streets: Phoenix Construction Company, $24,898.

October 28—For extending and improving the high pressure fire service system at Coney Island: Murphy Brothers, $68,379.25.

Table No. 14, attached hereto, shows the high pressure fire service mains laid to December 31, 1908. I also attach hereto several views showing details of the two pumping stations of the main high pressure system.

Work of Mount Prospect Laboratory.

Collection of Samples—Daily samples were taken from the terminus of the conduit at both the North and South Side Pumping Stations at Ridgewood, and also from the taps at Flatbush and Seventh avenues, and Flushing and Clermont avenues. These were examined physically and bacteriologically, and once a week microscopically and chemically. Weekly samples were collected from the distribution reservoirs for complete sanitary analysis, and weekly samples from all the surface supplies were examined physically and bacteriologically. Partial chemical analyses were made monthly of all surface waters, and complete analyses quarterly. Complete analyses were made monthly of all filtered supplies (mechanical plants, sand filters and infiltration galleries). Samples from most of the driven well stations have such slight fluctuations in quality that complete analyses are required only quarterly. Monthly, weekly, and in some cases, daily analyses were made of those ground waters that are high in chlorine and iron.

Analytical Work on Water—The following figures give the amount of analytical work during 1908:

| | |
|---|---|
| Total number of samples of water analyzed at Mount Prospect Laboratory | 3,231 |
| Total number of samples analyzed at Jameco Laboratory | 1,953 |
| Total | 5,184 |

| | |
|---|---|
| Total number of physical examinations | 3,419 |
| Total number of complete chemical analyses | 514 |
| Total number of partial chemical analyses | 2,169 |
| Total number of microscopical examinations | 1,025 |
| Total number of bacteriological examinations | 4,920 |
| Total number of bacteriological tests for baccilus coli | 4,949 |
| Total number of bacteriological tests for typhus | 59 |

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General Analytical Work—The following table shows the general analytical work done during the year:

| | |
|---|---|
| Coal samples analyzed | 463 |
| Metals and alloys analyzed | 81 |
| Cement samples analyzed | 52 |
| Oil samples analyzed | 24 |
| Sand samples analyzed | 3 |
| Rock samples analyzed | 3 |
| Paint supplies analyzed | 11 |
| Disinfectants analyzed | 2 |
| Boiler scales analyzed | 1 |
| Special tests and experiments made | 960 |

Reports—Weekly reports were made during the year giving the quality of the water in the distribution system.

During the year 475 special reports were made on the quality of the numerous sources of water supply, and on oil, coal and structural materials used by the Department. Weekly reports were made on the efficiency of the filter plants, and upon the amount of chlorine and iron as contained in daily analyses of the water from the wells at Jameco Pumping Station. The quality of the water delivered into the conduit by the Queens County Water Company was reported on every week, and monthly reports were made of the amount of chlorine and iron in the well waters affecting the supply.

Examinations of waters in flooded cellars were also undertaken during the year and six special reports were made as to the origin of these waters.

Special test and studies were made in relation to the determination of the presence of B. Coli in water; in connection with the transmission of typhoid from sources other than water supply, and of the methods used for the analyses of sewage. The chief experimental work for the year was on a method for the isolation of the typhoid fever germ from water.

Quality of the Water—Tables Nos. 18 and 19, attached hereto, give a comparison of the average quality of the water for 1907 and 1908 from the two influxes at Ridgewood Reservoir and from the taps at Flatbush and Seventh avenues and at Flushing and Clermont avenues.

Tables, etc.

The tables and diagrams attached hereto are as follows:

Table No. 1, showing monthly record of rainfall at Brooklyn and vicinity, from 1899 to 1909.

Table No. 2, showing monthly record of rainfall at Hempstead Storage Reservoir, from 1899 to 1909.

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Table No. 3, showing daily record of rainfall at Brooklyn and vicinity during 1908.

Table No. 4, showing daily record of rainfall at Hempstead Storage Reservoir during 1908.

Table No. 5, showing highest, lowest, monthly range of, and average temperature (degrees Fahrenheit) for ten years, between 8 and 9 a. m., at Hempstead Storage Reservoir.

Table No. 6, showing average daily consumption of water in Brooklyn for each month during 1908.

Table No. 7, showing average daily consumption of water in Brooklyn from 1899 to 1909.

Table No. 8, showing average, maximum and minimum daily consumption of water in Brooklyn during 1908.

Table No. 9, showing ratio of the average daily consumption for each month to that for the year from 1899 to 1909.

Table No. 10, showing average depth and corresponding contents in Ridgewood, Mount Prospect and Hempstead Storage Reservoirs during 1908.

Table No. 11, showing the total monthly and average daily pumping at Ridgewood for the year 1908, rainfall for each month and proportion of the rainfall corresponding to the pumping.

Table No. 12, showing the amount of water delivered at the Ridgewood Pumping Station from each source during 1908.

Table No. 13, showing water mains laid and removed and gates and hydrants set and removed to December 31, 1908.

Table No. 14, showing high pressure fire service mains laid and gates and hydrants set to December 31, 1908.

Table No. 15, showing water mains laid and gates and hydrants set during the year 1908.

Table No. 16, showing net amount of water filtered at the various filter plants and cost of filtration per million gallons during 1908

Table No. 17, showing average results of analyses of raw and filtered water at the various filter plants during 1908.

Table No. 18, showing average quality of the water for the years 1907 and 1908 from the Ridgewood Reservoirs.

Table No. 19, showing average quality of the water for the years 1907 and 1908 from the taps at Flatbush and Seventh avenues and at Flushing and Clermont avenues.

Diagram No. 1, showing contents of reservoirs and consumption in U. S. gallons, together with rainfall and temperature records from 1896 to 1909.

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Diagram No. 2, showing the quality of the Brooklyn water supply during 1908.

The following photographs are also attached:

No. 1—Main High Pressure Fire Station, Furman and Joralemon streets.

No. 2—Interior of the Main High Pressure Fire Service Station.

No. 3—Operating Switchboard, Main High Pressure Fire Service Station.

No. 4—Reserve High Pressure Fire Service Station. Willoughby and St. Edwards streets.

No. 5—Interior of the Reserve High Pressure Fire Service Station.

No. 6—Operating Switchboard, Reserve High Pressure Fire Service Station.

No. 7—Motor operated, high tension oil switch compartments, Reserve High Pressure Fire Service Station.

No. 8—800-horsepower, 6,600 volt induction motor driven 6-stage turbine pump, High Pressure Fire Service Stations.

Engineering Force.

In severing my connection with this Bureau, I desire to express my appreciation of the ungrudging assistance and unfailing support I have received from the members of the Engineering Corps of the Bureau, who, one and all, have throughout fulfilled their duties most faithfully and satisfactorily.

Respectfully submitted,

J. W. McKAY, Acting Chief Engineer.

APPENDIX I.

Agreement with the Fire Department as to the operation of the high pressure fire service system:

This agreement, made and entered into this 18th day of November, in the year 1908, between the Commissioner of Water Supply, Gas and Electricity and the Commissioner of the Fire Department, in regard to the high pressure fire service system in the Borough of Brooklyn, witnesseth as follows:

First—From and after 8 a. m., November 18, 1908, the high pressure fire service system in the dry goods, office building and river front districts shall be permanently in service, so that it may be put into operation whenever required by the Fire Department.

The Coney Island system shall be operated under the same conditions as heretofore.

Second—The operation of the high pressure fire service stations, and their maintenance and repairs, as well as the maintenance and repairs of the distribution system, shall remain as hitherto, under the control of the Department of Water Supply, Gas and Electricity.

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Third—The pumps at the high pressure stations shall be started immediately upon receipt of an alarm from the protected district. The initial pressure to be put upon the mains in the dry goods, office building and river front districts shall be seventy-five (75) pounds per square inch; in the Coney Island system this initial pressure shall be one hundred and fifty (150) pounds per square inch.

The Fire Department shall direct the Engineman in charge of the watch at the stations by means of the high pressure telephone service how the pressure is to be regulated and when the service of the pumps is no longer required.

During the progress of a fire, from the time the alarm is received until the Fire Department directs that the service of the station be discontinued, the Enginemen in charge of the stations remain under the orders of the Fire Department.

In case of complete failure of the high pressure telephone service, the stations may be called through the public exchange.

Telephone number of main station, 6785 Main.

Telephone number of reserve station, 5860 Main.

Telephone number of Coney Island station, 446 Coney Island.

Fourth—The high pressure fire service system covers the so-called dry goods, office building and river front sections and the Coney Island amusement district. The boundaries of the former are, roughly, East River, Navy Yard, St. Edwards street, Ashland place, Fourth avenue, Dean street, Clinton street, Harrison street, Henry street, Rapelyea street, Columbia street, Dwight street, Erie Basin and Uupper Bay. This district is subdivided into the "Main" and "Reserve" districts; that section lying west of a line drawn through Fulton street, from the East River to Court street, and through Court street, from Fulton street southward, is designated as the main district; the section lying east of the before mentioned line is known as the reserve district.

The pumping station in the main district, designated as the main station, is located at the northeast corner of Furman and Joralemon streets; the pumping station in the reserve district is located at the northwest corner of Willoughby and St. Edwards streets, and is called the reserve station. While either of these two high pressure fire service stations can deliver its full capacity at any point within the two districts, for purposes of operation, under normal conditions, the main station will respond to all alarms emanating from the main district and the reserve station will be put into service for all alarms emanating from the reserve district.

Whenever required, the full capacity of both stations can be concentrated at any point within the above two high pressure fire districts.

Fifth—The main station is designed to deliver either fresh or salt water; it is equipped with five (5) motor-driven multi-stage turbine pumps, each with a capacity of 3,300 gallons per minute, at a pressure of 300 pounds per square inch. The total capacity of this station is not less than 16,500 gallons per minute. The reserve station

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is equipped with three (3) similar units for pumping fresh water, giving a total capacity for this station of not less than 9,900 gallons per minute at the same pressure. Thus the total capacity of the two stations corresponds to a minimum delivery of 38,000,000 gallons in twenty-four hours against a pressure of 300 pounds per square inch.

The pressure can be regulated from 75 to 300 pounds, as may be desired.

Sixth—The Coney Island System covers the amusement section at that resort, from West Fifth street to West Seventeenth street, south of Surf avenue, and the west side of Luna Park. Bids have been opened for an extensive addition to this system embracing the section south of Surf avenue to West Twenty-eighth street; between Neptune and Surf avenues, from West Fifth to West Eighteenth streets, and Sea Breeze avenue.

The pumping station supplying the fire service mains is located on Coney Island Creek, adjacent to the Coney Island sewage disposal plant, at Neptune avenue and West Twelfth street. It is designed to pump either fresh or salt water and is equipped with three (3) gas-engine driven triplex, double-acting pumps, each with a capacity of 1,500 gallons per minute against a pressure of 150 pounds per square inch, thus giving a total capacity of 4.500 gallons per minute, or 6,480,000 gallons per twenty-four hours. The addition of another unit is under contemplation.

Seventh—The extreme pressure at the pumps can be transmitted from any station to the most distant point within the system which that station supplies in about one minute.

Eighth—As soon as the pumps are no longer needed, the Fire Department shall direct the Engineman in charge of the watch at the station to discontinue service; this notice shall be given within six minutes after the last line on the high pressure system is shut down.

Similarly, after the receipt of an alarm from the protected district, should the service of the stations be not needed, the Fire Department shall promptly notify the Engineman in charge of the watch at the station of that fact. This notice to discontinue service shall also be given by the Fire Department within six minutes after the receipt of the alarm.

Ninth—In case of a break in the mains in the main and reserve districts, the Fire Department shall immediately notify the North Portland avenue repair yard, the telephone call of which is 174 Main. In the Coney Island district the Coney Island repair yard should be notified; telephone call, 112 Coney Island.

Tenth—The Department of Water Supply, Gas and Electricity has furnished the Fire Department with maps of the distribution system, showing location of mains, hydrants, gates and telephone boxes. The above data give complete information with regard to the system.

The Fire Department has also been furnished with outer box keys for the telephone boxes.

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The Department of Water Supply, Gas and Electricity has started to put collars around the valve stems of the high pressure fire hydrants so that they may not be opened with the ordinary wrench. The Fire Department has been equipped with the special wrenches for use in operating these hydrants.

## APPENDIX II.

Rules and regulations for the operation of the main and reserve high pressure fire service pumping stations:

### General Notice.

The rules herein set forth govern the employees of the Department of Water Supply, Gas and Electricity, stationed at the high pressure fire service pumping stations.

Special instructions may be issued from time to time by proper authority.

The fact that any person enters or remains in this service will be considered as an assurance of willingness to obey the rules. No one will be excused for the violation of any general rule or special instruction which may be issued. Ignorance of any rule will not be accepted as an excuse for not complying with the same. Obedience to the rules is essential to the safety of the public, the employees, and for the protection of property.

The Department demands the faithful, intelligent and courteous discharge of duty.

An employee accepting employment assumes the risks attached to the position.

It is of the utmost importance that the rules for the government of the employees should be enforced in order to make such rules efficient. If they cannot or ought not to be enforced they ought not to exist.

Officers or employees whose duty it may be to make or enforce rules, however temporary or unimportant they may seem, should keep this clearly in mind. If, in the judgment of any one whose duty it is to enforce a rule, such rule cannot or ought not to be enforced, he should bring it at once to the attention of those in authority.

If any doubt exists in the mind of any employee as to the meaning or application of these rules, he must apply to the proper authority for an explanation.

### Watches at Station.

Rule 1. The stations shall be in constant service, and for their operation the day will be divided into three eight-hour watches, as follows:

Watch No. 1, 12 midnight to 8 a. m.

Watch No. 2, 8 a. m. to 4 p. m.

Watch No. 3, 4 p. m. to 12 midnight.

Each one of these watches will be in charge of an engineman or stationary engineer, who will hereafter be designated as "Operator."

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Enginemen and Other Employees.

Rule 2. Each pumping station will be in charge of one Operator, to be known as "Engineman in Charge," who will be directly responsible for the operation of that station during Watch No. 2, and to whom the Operators on the other two watches shall report. All other employees, such as Oilers, Telephone Operators, etc., shall report directly to the Operator in charge of the watch on which they report for duty, while the Engineman in Charge or Operator shall report to and receive directions from the office of the Chief Engineer for the Borough of Brooklyn with regard to the operation of the station.

All employees shall remain within the station buildings while on duty unless otherwise ordered by the Engineman in charge of the station.

Special Services.

Rule 3. Should the services of any employee at any of the high pressure fire service pumping stations be required at any particular time outside of his regular hours for duty he shall report for such service as directed.

Absence from Duty.

Rule 4. Should any employee of the station fail to report for duty at the time at which he should relieve the man on the preceding watch the latter shall remain on duty until relieved.

Should any employee fail to report for duty on his watch or report more than one-half hour late an entry of such absence or lateness must be made in the day's log, unless a previous arrangement has been made between the man on watch and the one who is to relieve him and approved by proper authority.

Record of Employees.

Rule 5. The Engineman in Charge shall have a record kept of the names and addresses of every employee in the station, and also the nearest points where they can be reached by telephone. Employees must report to the Engineman in Charge all changes in addresses. The above record shall be accessible at all times to the Operator in charge and copy of the same be transmitted to the office of the Chief Engineer of the Department for the Borough of Brooklyn.

Operators' Knowledge of Apparatus.

Rule 6. Station Operators must thoroughly familiarize themselves with all apparatus in their charge or which they may be called on to operate in case of emergency.

Caution in Handling Apparatus.

Rule 7. Owing to the pump motors and various other parts of the electrical equipment carrying current of such high potential as to endanger life, the greatest caution should be observed in handling this apparatus.

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Handling of High Tention Apparatus.

Rule 8. No employee shall handle or touch, either with or without rubber gloves. any switch, cable, bus, connection, conductor or any other apparatus which at any time carries high potential current, until he has positively ascertained of his own knowledge that such apparatus is disconnected from all sources of high potential, both by the opening of the oil switches and the disconnecting switches. This applies also to the replacing of fuses on the potential transformer circuits. Such fuses must not be replaced while the plant is in operation.

Visitors to Stations.

Rule 9. Operators on duty in stations must not permit visitors in the vicinity of switchboard or motors, unless written permission is first obtained from the office of the Chief Engineer.

Visitors shall not be permitted, however, to enter the bus bar or oil switch rooms, unless such permission is specifically given on their permit to visit the station, and in such case the station Operator must accompany them.

Admission to Bus Bar and Oil Switch Rooms.

Rule 10. No unauthorized employee shall be permitted to enter the bus bar or oil switch rooms, unless accompanied by the station Operator. These rooms shall be kept locked.

Intoxicated Persons.

Rule 11. No intoxicating liquors or intoxicated persons, either employees or visitors, shall be permitted in the stations.

Care of the Bus-Bar and Oil-Switch Rooms.

Rule 12. The bus-bar room and oil-switch room must not be used for the storage of supplies, or any other materials. The floors must be kept free from obstruction of all kinds, and free from dust and dirt.

Inspection by Brooklyn Edison Company.

Rule 13. Inspectors from the high tension department of the Edison Electric Illuminating Company of Brooklyn will make regular inspections of all high tension parts.

They will also attend to the dusting of insulators of the high tension conductors, and the adjustment of oil switches, relays, instruments, etc., on the high tension system.

The main and reserve high pressure fire service stations are to be considered operatively as Edison substations, and all orders issued by that company's system operator, provided that they do not result in shutting down the stations while on fire service, must be immediately and implicitly obeyed.

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Log Book.

Rule 14. Operators must keep a station log book, and keep all records in a neat and complete condition. A duplicate of the log book shall be forwarded at the end of each month to the office of the Chief Engineer for the Borough of Brooklyn.

All ordinary and extraordinary occurrences relative to the operation of the station must be entered in the station log, and every such occurrence must also be shown in the Operator's report at the end of his tour of duty.

Dial Sheets on Recording Instruments.

Rule 15. Operators must change the dial sheets on the recording instruments regularly every twenty-four hours, and keep the same filed for future reference.

General Care of Stations.

Rule 16. Operators must see that the building and its contents are kept in a clean and sanitary condition.

Every precaution must be taken to prevent the raising of dust during cleaning operations. Damp sawdust must be thoroughly sprinkled over floors before sweeping.

Removal of Dust and Moisture.

Rule 17. Motors, pumps, piping, fixtures, instruments, etc., must be frequently wiped off, to prevent the collection of dust and moisture.

The switchbard and controlling apparatus and all electrical contracts, such as brushes, commutators, controller fingers, collector rings, segments and every current-breaking part, must be frequently inspected, kept clean, free from moisture and in good working order.

All bright parts shall be kept polished, and piping, etc., painted.

Supervision of work of Brooklyn Edison Company.

Rule 18. Operators must personally attend to the cleaning of high tension insulators, bus-bars, conductors, switches, and all other high tension carrying parts, by the Edison Company's inspector, and see that particular attention is paid to keeping these parts clean and free from dust and moisture.

Grounding of Instrument Wiring.

Rule 19. The secondary circuits from series and potential transformers to instruments are grounded to prevent a high potential on these connections from leakage or induction. Care must be taken that these ground connections are maintained in perfect condition.

Oil Switches.

Rule 20. Under normal conditions the feeder oil switches, as well as the unifying or tie oil switches, must be kept closed, keeping the bus-bars alive; the motor-oil-switches must be kept open.

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Controller Handwheel.

Rule 21. The controller handwheel on each motor panel of the switchboard must always be at the off position, when the motors are not running.

Short-circuiting Levers on Motors.

Rule 22. The hand-operated, short-circuiting levers at the collector rings of the induction motors must be always at the starting position when the motors are not running; in this position the brushes bear on the collector rings.

Clearance Space Between Rotors and Stators.

Rule 23. Owing to the small clearance space between the rotors and stators of induction motors, their bearings must be inspected to see that they are not worn sufficiently to cause the rotors to rub against the stator. This clearance space or air gap must be gauged after each run.

Series Transformers.

Rule 24. Care must be taken that the secondary coils of series transformers are never open-circuited.

Handling Bus-Bar and Oil-Switch Compartment Doors.

Rule 25. The doors of the high tension bus-bar and oil-switch compartments must be immediately replaced after completing inspection or work on such compartments. These doors must not be removed or opened while current is on the conductors in their respective compartments, under any circumstances.

Manipulation of Disconnecting Switches.

Rule 26. The disconnecting switches must never be open while a load is being carried on the conductors they control. The oil switches must be opened first in every case. The disconnecting switches must never be opened by hand; a pole provided with a hook is supplied for that purpose.

Hand Operation of Oil Switches.

Rule 27. In case an oil switch fails to operate on manipulation of the switchboard controlling switch (as will be indicated by the pilot lights), the oil switch can be operated manually by winding the spring with the lever provided for that purpose, and releasing the spring by hand at the solenoid trip. The pilot lights on the switchboard, when connected with the oil switches, show green when oil switch is open and red when closed.

Winding of Fire Alarm Signal Gong.

Rule 28. As soon after the receipt of an alarm as the proper operation of the plant will permit, the driving spring of the mechanical signal gong must be rewound,

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care being taken that only sufficient force for winding the spring is applied, that the instrument may be not strained or injured.

Notification of Fire Department.

Rule 29. In case of trouble with the fire alarm signal instruments, notify at once Fire Headquarters Telegraph Bureau, Jay street, Brooklyn, by means of the direct line from the station telephone switchboard.

Telephone System Out of Order.

Rule 30. In case of trouble on the telephone system, notify at once the wire chief at main exchange of the New York and New Jersey Telephone Company.

Accidents in Station.

Rule 31. In case of accident or emergency in the station, the official designated by the Chief Engineer shall be notified without delay.

Accident to Piping System.

Rule 32. Any accidents to, or breaks in the distribution system which may be reported to the main or reserve station, must be immediately reported to the North Portland avenue repair yard, the telephone number of which is 174 Main. At the Coney Island station such accidents must be reported to the Coney Island Repair Yard, 112 Coney Island.

Telephone Inspector.

Rule 33. A representative of the Telephone Company will be authorized to visit the oil-switch gallery for the purpose of inspecting, repairing or charging the storage battery or for periodical inspections of the company's apparatus installed.

The time of this representative's visit must be noted in the log book and a report made of the same.

Telephone Test Calls.

Rule 34. The operators of the station must receive the test calls made by the telephone company's inspectors, and must enter in the log and report the station numbers from which such test calls were sent, together with the time and the inspector's name or initial.

Valves at Reserve Station.

Rule 35. All valves at the reserve station, whether motor operated or not, shall be normally open, with the by-pass valves closed.

Valves at Main Station.

Rule 36. All valves at main station, whether motor operated or not, with the exception of the 12-inch valves on the salt water suction lines, and the 12-inch valve

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on the by-pass between the supply and delivery mains, shall be normally open, with their by-pass valves closed.

These valves shall only be closed when necessary in case of trouble, to make repairs to the system, or while testing operating mechanism.

Oiling Motor Operated Valves.

Rule 37. The shaft that carries the intermediate gears should be oiled through the hole provided in the "tip-out" block. The bearing surface of the large gear should be oiled on the yoke nut and at bearing of the yoke nut where it passes through the top of the yoke. The threads of the spindle and teeth of all gears should be lubricated slightly with Albany grease.

Valve Motor Bearings.

Rule 38. The motor bearings are self-lubricating; therefore, do not use oil on them, as oil would ruin the graphite plugs in the bronze linings.

Disengaging Handwheels.

Rule 39. On the larger valves having heavy handwheels, the handwheel should be disengaged when operating by motor.

Disengaging Valve Motors.

Rule 40. When operating by hand, the motor may be disengaged by the tip-out block.

Caution in Use of Lost Motion.

Rule 41. There is a hammer blow or lost motion feature which aids in starting the valve from its seat; in cleaning or inspecting, the gears should not be left in such a position as to make this feature inoperative; that is, leave the "back-lash" for the motor to take up. This caution should be observed also when the valve is stopped at any intermediate point in its train.

Method of Operating Valve Motors.

Rule 42. The tripping coil on the drum controller is short-circuited when the segments first make contact, but receives current when the handle is locked in. This is to avoid tripping the retaining catch on the first rush of starting current. Therefore, do not push handle to the full open or closed position until the motor has attained full speed.

Setting Tripping Device.

Rule 43. The tripping adjustment within the controller should always be set at as low a value as possible.

Cleaning Commutators, etc.

Rule 44. The copper segments of the controller and motor commutator should be kept smooth, clean and slightly lubricated with vaseline.

The commutator and brushes of the motor should be inspected daily.

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### Testing Motor Operated Gate Valves.

Rule 45. The motor operated valves should be tested by closing and opening once a day to make sure that they are in good working order.

## Turbine Pumps,

### Bearings.

Rule 46. The bearings should be filled as full as possible with first class lubricating oil similar to dynamo oil.

### Prevention to Air Leakage on Suction End.

Rule 47. To prevent air leakage through the stuffing box on the suction head of the pump there is provided a gland cage within the stuffing box on each side of which there are placed three rings of graphite and hemp or flax packing; on the outside of the stuffing box is a one-fourth inch (¼-inch) pipe tap which connects to the gland cage. To this tap is connected a pipe running from the discharge of the first stage, thus making a water seal in the stuffing box and preventing all air leakage.

### Stuffing Boxes.

Rule 48. Care must be taken to see that the packing in the stuffing boxes is properly placed and that there is no air leak at this point, as a small quantity of air entering the pump case from this source might result in the pump losing its suction.

On the other hand, this packing must not be made too tight, as this may result in burning the packing and cutting the shaft. If square section hemp packing is used it should be placed in rings cut at an angle of 45 degrees, instead of a radial butt joint, and the different rings should have their joints broken.

On starting the pump after repacking, it is better to have the packing slightly loose without causing an air leak, and if it does seem to leak, rather than to put too much pressure on it, place some heavy oil in the gland until the pump works properly and then gradually take up the packing glands. The packing will need to be changed occasionally.

### Precaution in Cold Weather.

Rule 49. During cold weather when not in operation care should be taken to prevent the pump and piping from freezing.

### Priming.

Rule 50. The pumps at the reserve station and also at the main station, when using fresh water, will not require priming, the water coming to suction under pressure. At the main station, when salt water is to be used, priming will be necessary. The smaller vacuum pump is designed to maintain a vacuum in the salt water suction pipe at all times; the larger pump is designed to automatically start when the small pump fails to keep the required vacuum.

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### Pumping Salt Water.

Rule 51. In starting with salt water, when the fresh water supply fails, the fresh water suction valve must first be closed; the salt water suction valve then opened. The valves on the manifold at top of pump case which it is desired to prime should be opened and closed again as soon as water in sight-glass shows that pump is primed, the pump being started at the same time.

### Draining of Priming System.

Rule 52. The priming pipe should be drained after priming each pump in order to insure that no water passes through the system to the cylinders of the vacuum pumps, as this would cause serious injury to them.

### Starting of Pumps.

Rule 53. In priming the pumps it is necessary to exhaust the air thoroughly from each stage. In all cases the pump should be started only after it is entirely filled with water. Careful attention to the subject of priming when the pump is first put into service will save trouble from the failure of the pump to handle water, owing to improper arrangements.

### Priming Pumps Under Gravity Pressure.

Rule 54. Should the pumps require priming when gravity supply is available open fresh water supply valve to pump and release air from pump by means of the small air-cocks on the top of the pump.

### When to Pump Salt Water.

Rule 55. Salt water shall not be used for pumping at the main station unless all fresh water supply lines at both the main and reserve stations are out of service, or if ordered by proper authority.

### Pressure Regulating Valves.

Rule 56. The operation of each pressure regulating valve is controlled by two small pilot valves, one a reducing and the other a relief valve. To increase pressure on the fire mains turn the handwheels of both pilot valves at the same rate to the right; to decrease pressure turn the same handwheels to the left.

See that the valves on the small piping from the inlet side of the pressure regulating valves, through the reducing pilot valve, to the top of the pressure regulating valve, thence through the relief pilot valve to the outlet side of the pressure regulating valve, are open, so as to form a continuous passage for a small stream of water from one side of the pressure regulating valve to the other.

See that the small valves enabling any pilot valve to be removed in case of emergency be open.

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At the main station there is a branch connection to the top of the pressure regulating valve, enabling full pressure to be admitted and consequent full opening of that valve. See that the small valve on this connection is kept closed. It is to be opened only in case the maximum pressure capable of being devoloped by the pumps is desired on the fire mains.

Operation of Pressure Regulating Valves.

Rule 57. The pilot valves after each run are to be left so that the screws operated by the handwheels are at the extreme points of travel upwards. After the pump is up to speed turn handwheels of pilot valves, at the same rate, slowly to the right until the desired pressure on the line is attained.

Relief Valves to Sewer.

Rule 58. The relief valves on the eight-inch waste lines, from the fresh water supply mains to the sewer, should be inspected weekly to see that no water runs to waste through possible defective setting of the valves. These valves should be set to relieve at seventy-five pounds per square inch.

Closing Valve on By-Pass.

Rule 59. The twelve-inch valve on the reserve station by-pass (which maintains the fire mains under distribution pressure), as well as the motor-operated delivery valves at both stations, shall be closed upon discovery or report of a leak or break on the fire mains. The North Portland avenue repair yard should at once be notified of the detection of any such leak or break.

The twelve-inch valve on the main station by-pass (which also maintains the fire mains under distribution pressure) shall be kept normally closed. Should the reserve station be put out of service the twelve-inch valve on the station by-pass, as well as the two sixteen-inch motor-operated delivery valves, shall be closed during this period, the twelve-inch valve on the main station by-pass being kept open until the reserve station is restored to service.

By-Pass Venturi Meters.

Rule 60. Should any appreciable flow of water be indicated by the twelve-inch Venturi meter on the by-pass between the supply and delivery mains it should immediately be reported to the office of the Chief Engineer and to the North Portland avenue repair yard.

Venturi Meters.

Rule 61. The Venturi meter registers and chart recorders are for use in connection with the Venturi meter tubes, and each is connected to its respective Venturi tube by two small pipes, one of which connects to the up-stream pressure chamber, and the other connects with the throat pressure chamber. The instrument has two dials. The lower, or registering dial, shows the total quantity of water that has passed

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through the meter tube, and the upper, or chart-recording dial, records continuously the rate of flow in "gallons per minute." These records are made on circular charts, and each chart represents a twenty-four hour run.

The small air-cocks on the piping at the rear of the Venturi meter registers shall be tried, and all air collected therein blown out daily before setting new charts.

To prevent the mercury being blown out of wells into the upper parts of the register, or pressure piping, the by-pass valve should always be open before closing any of the pressure valves.

Recording Instruments.

Rule 62. The Engineman in Charge shall change the dial sheets on all of the recording instruments regularly every twenty-four hours, and forward the removed sheets at the end of each month to the office of the Chief Engineer.

Pens on the flexible arms shall be filled regularly with a first class recording ink.

The clock shall be wound weekly and the mechanism examined and oiled regularly.

Supplies for Stations.

Rule 63. All requisitions for supplies shall be made on the regular forms furnished for that purpose and sent to the office of the Chief Engineer.

At the time of receiving supplies, a full record of same shall be made in a book provided for that purpose, and entry shall also be made of the amount of supplies used for each station, so that the balance on hand may at any time be easily ascertained.

Repairs and Renewals.

Rule 64. The Engineman in charge shall keep a full record of all work done on repairs, renewals or replacements, including name of contractor and workmen, time worked by each man and all material furnished. The same rule shall hold in case of such work being done by Department men from any of the repair yards.

The Engineman in charge shall also keep a record of all materials, etc., that may be rejected or returned, and obtain a receipt for same before allowing them to be removed from the station.

## OPERATION IN CASE OF FIRE.

Operators to Act in Accordance With Agreement With the Fire Department.

Rule 65. Operators must familiarize themselves with the agreement made on November 18, 1908, between the Department of Water Supply, Gas and Electricity, and the Fire Department, for the operation of the stations, copy of which agreement is attached hereto.

Their attention is particularly called to the clause providing that during the progress of the fire, orders as regards the pressure shall be directly given by the Fire Department and must be obeyed with the least possible delay.

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Starting of Pumps.

Rule 66. On receipt of a signal emanating from a fire alarm signal box within the station district, as shown by the signal directory, the operator shall immediately start one pumping unit and bring it to speed as soon as possible.

In case of a difference between the individual rounds of a fire alarm signal, or any doubt as to the number of the signal, the operator shall call up fire headquarters for the correct number, immediately.

Initial Pressure.

Rule 67. The pressure to be maintained on the fire mains system, after the receipt of an alarm, shall be seventy-five (75) pounds per square inch. This pressure must be held until the Fire Department gives notice to change it, or to shut down.

Method of Starting Pump.

Rule 68. First—See that the hand-operated, short-circuiting lever on the induction motor is at the starting position, and that the brushes are bearing on the collector rings.

Second—See that the controller hand-wheel on the motor panel is at the off position.

Third—See that the oil switch feeding the bus-bar section, from which the motor is to be controlled, is closed.

Fourth—Close the oil switch controlling the motor that it is desired to start. (This cannot be done from the operating switchboard unless the controller hand-wheel is at the off position.)

Fifth—By means of the hand-wheel on the switchboard controlling the rotor resistance, gradually cut out the resistance in the rotor circuit, thus bringing the motor to speed. (This should require not less than thirty seconds nor more than three-quarters of a minute.)

Sixth—When the rotor resistance is all cut out, and the motor is up to speed, turn the hand-operated, short-circuiting lever to the running position, lifting the brushes clear of the collector rings.

Seventh—Then turn the controller hand-wheel on the motor panel to the off position.

Failure of High Tension Current While Running.

Rule 69. Should a circuit-breaker or a feeder open while a motor is running, bringing the latter to a stop, or should any other interruption occur in the 6,000-volt current, the station operator must immediately open the motor switch, bring the motor to the starting position, and ascertain whether current can be obtained on another feeder; if so, start a motor immediately.

In the event of no current on any feeder, the operator shall watch the volt meter or pilot lamps, and will immediately start the motor when the voltage rises to 6,000.

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Failure of Motor to Start.

Rule 70. In the event of a motor failing to start from any cause whatever, immediately start another machine.

Inspection While Running.

Rule 71. While in operation, the bearings and all accessible moving parts must be inspected frequently.

Stopping Induction Motors.

Rule 72. First—Open the oil switch controlling the motor that it is desired to stop.

Second—Turn the hand-operated short-circuiting lever on the motor frame to the starting position.

Third—See that controller handwheel on the motor panel is in the off position.

Starting of Additional Pumps.

Rule 73. The Operator at the station shall not start additional pumps until the pump or pumps already in operation fail to hold the required pressure on the line without lowering the net pressure at the pump or pumps below three hundred pounds. This will be indicated by a delivery of 3,300 gallons per minute for each pump, or a discharge pressure at each pump of three hundred pounds plus or minus the suction pressure.

Thus, if at the beginning of a fire one pump has started, with a pressure of one hundred pounds on the line, the Operator shall not start another pump until the delivery gauge on the pump shows a continuous falling in pressure to the critical point of three hundred pounds net, above mentioned. In that case he shall start a second pump, and this second pump shall be continued in operation until a similar continuous falling in pressure (or increased delivery indicated by the Venturi meters) shows the need of putting a third unit into operation, and so on. This rule shall hold good, whatever pressure may be required on the fire mains.

By means of the pilot valves which control the operation of each pressure regulating valve the Operator shall apportion the load on the pumping units evenly.

In case of emergency, when the demand upon the stations should exceed the rated capacity of all the pumping units (i. e., 3,300 gallons per minute per unit), the net pressure at the pumps may be allowed to drop to 260 pounds per square inch, thus increasing the delivery of each pump to 4,000 gallons per minute, when using fresh water.

When pumping salt water the pressure at the pumps, in case of emergency, may be reduced to such pressure as will maintain proper water circulation around thrust bearing.

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Three Pumps to Be Started at Each Station.

Rule 74. After three pumps at either pumping station are in operation under normal conditions and working at their full rated capacity at the pressure desired on the line, if still more water is required by the Fire Department, it shall be supplied from the other station to the extent of the capacity of three pumps, thus leaving two pumps in reserve at the main station.

Therefore, after three pumps are in operation at one station to their full rated capacity, if more water is required by the Fire Department, the other station must be notified by the operator at the original station, and the operator at the second station shall start one pump and a second and third if needed, in which case the six pumps will be working to their full capacity and approximately the same pressure.

Notify the system operator of the Edison Company, when more than three pumps are necessary to be put into operation.

Starting Fourth and Fifth Pump at Main Station.

Rule 75. After the three pumps at each station are in operation, if still more water is desired, the fourth and fifth pump at the main station shall be started.

Pressure Regulation for a Large Single Fire.

Rule 76. When two stations are in service pumping water for a single fire, the operator at that station which receives the telephone orders direct from the Fire Department shall order the operations at the other station, in case its services are needed.

Before outlining the method to be pursued, it is necessary to bear in mind that when the Fire Department asks for a certain pressure on the fire mains (100 pounds, 150 pounds, 200 pounds, or whatsoever it may be) it may be accepted as the pressure on the mains near the stations, as indicated by the delivery gauges on the operating switchboards. Owing to difference in elevation of the two stations and to difference in friction losses in the fire mains, when the two stations are pumping, the indicated pressures on the line at the two stations will differ slightly.

Therefore, after three pumps are in operation at either station, and the indications are that more water will be required, the operator will call upon the other station to start up one pump, advising the other operator of the pressure required by the Fire Department. The second station will start one pump and see that it delivers its full rated capacity, irrespective of the pressure that the regulating valve must be set in order to deliver same. (It will be in the neighborhood of the pressure required by the Fire Department.) The operator at the first station can observe by means of the delivery gauges at the pumps or by the Venturi meters, or both, whether additional pumps are needed. The second station, when ordered to start an additional pump will run it also at its full rated capacity and will shut down or reduce line pressure upon orders from the operator at the first station.

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Orders from the Fire Department to increase pressure shall be at once communicated to the second station. In case of an order from the Fire Department, when running under these conditions, for a reduction of pressure, the second station shall first be notified to shut down one unit and to manipulate the pressure regulating valves (while the operator at the first station lowers the pressure on the line) so as to maintain the remaining pump or pumps at their rated capacity.

Pressure Regulation for Two or More Simultaneous Fires in the Same District.

Rule 77. Should there be two or more fires in the same district, and the Fire Department requires a higher pressure at one of them than at the others, the operator shall first notify the Fire Department at the scene of the smaller fire or fires before raising the pressure on the system. For this purpose the Fire Department will always keep an official within hearing of the telephone bell at the private telephone box from which the orders to the station were originally given.

Should more than three pumps be required, the procedure shall be as outlined above in Rule 76.

Pressure Regulation for Two or More Simultaneous Fires in Different Districts.

Rule 78. When one station is responding to an alarm in one district and a fire alarm be received from the other district, the original station shall be kept in operation for both fires. In case of different pressures required on the line, or of more than three pumps needed, the methods of operation shall be as hereinbefore outlined.

In Case of Breakdown, One Station to Relieve the Other.

Rule 79. In case of complete failure of fresh water supply at either station, or of a complete breakdown from any other cause, the operator shall notify the other station of the breakdown, and that station shall immediately be put into operation, taking orders from the Fire Department through the telephone tie line connecting the two stations. The operator at the main station shall only start pumping salt water when he finds that the demand of the Fire Department for water is greater than the capacity of the reserve station.

In case of complete breakdown of both stations, Fire Headquarters must be immediately notified; also the Office of the Chief Engineer of the Department of Water Supply, Gas and Electricity.

Upon resumption of service the same officials shall be notified to that effect.

Shutting Down Pumps.

Rule 80. When more than one pump is running and the Venturi meters as well as the delivery gauges at the pumps indicate that the running of some of the pumps is unnecessary, such pump or pumps shall be shut down.

When only one pump is running, and no delivery is indicated for more than fifteen minutes, the small cock on the line shall be opened so as to replace the water in the

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pump and thereby prevent excessive heating. In case of emergency from this cause, start another pump and then shut down the first one.

Daily Tests.

Rule 81. In order to insure the highest efficiency of the pumping plants and their continuous service, every pump in each station shall be operated every twenty-four hours to test its condition and pressure regulation in such manner as may be directed from time to time.

Additional tests may be called for at varying times by the Chief Engineer.

All test runs must be recorded in full detail in the daily logs, as in case of fire service.

Periodic examinations as often as may be ordered by proper authority shall also be made of all the piping and valves in the station and in the chambers communicating with it.

Alarm for One District and Telephone Message from the Other.

Rule 82. In case of a fire-alarm signal from a box near the boundaries of the two districts, it is possible that the Fire Department will transmit orders through a telephone box communicating directly with the other station. The telephone operator will then enable the Fire Department orders to be transmitted directly to the station in service over the private tie line connecting the two stations.

Telephone Service.

No Private Messages.

Rule 83. The telephone service at the high pressure fire service stations is installed exclusively for the operation of the system and for such official messages as are required for the maintenance and repairs of same. The telephone operator, therefore, must not transmit private messages under any circumstances.

Telephone Records.

Rule 84. The telephone operator must record in a book provided for that purpose all orders received for the operation of the pumping station where he is on duty—i. e.:

Time at which first alarm is received, with box and number.

Time of following alarms, if any.

Orders received, with circuit and telephone box number and name of Fire Department officer giving the order.

Time of receipt of subsequent orders, circuit and telephone box number and name of officer sending said order.

All orders received from Fire Department Officers must be repeated back by the telephone operator for verification.

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No Messages During a Fire.

Rule 85. During the progress of a fire the telephone operator shall remain continuously at the switchboard, with the receiver kept to his ear, so that he may immediately receive and transmit the orders from the Fire Department and reply to same. While thus engaged he shall not transmit any other messages except to Fire Headquarters, system operator of the Edison Company, or other authorized official, and shall not establish communication for other than official business.

RULES AND REGULATIONS FOR THE OPERATION OF THE CONEY ISLAND HIGH-PRESSURE FIRE SERVICE STATION.

Rules Applicable to This Station.

Rule 86. The attention of the employees is called to the Agreement with the Fire Department, General Notice and Rules 1, 2, 3, 4, 5, 6, 11, 14, 15, 16, 17, 29, 30, 31, 32, 34, 45, 62, 63, 64, 65, 71, 83, 84 and 85, and to their application to this station.

Initial Pressure.

Rule 87. The pressure to be put upon the mains upon the receipt of a fire alarm from the protected district shall be one hundred and fifty (150) pounds per square inch.

Orders from Fire Department.

Rule 88. All orders received from the Fire Department, while the station is in operation, must be implicitly obeyed.

Method of Starting Machines.

Rule 89. First—Open oil cups on crank shaft.

Second—Throw in switches for ignition current.

(The switches at the top of the ignition board, when thrown upward, will furnish current from the generators; in case of failure of Edison current, by means of the relay the batteries will be thrown into circuit automatically. In case of trouble with the relay, open switch on right side of board, throw the double throw switch at the lower left hand side downward for generator current. To run on battery current when relay is cut out, open both upper switches and throw the double throw switch at the lower left hand corner upward.)

Third—Open valves on compressed-air tank.

Fourth—Open hand valve near top of gas-engine cylinder.

Fifth—Open air valve.

Sixth—Open gas inlet to ⅛ mark.

Seventh—Throw in lever when explosion is heard.

Eighth—Increase gas.

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Ninth—Open oil cups on both sides of engine. (Multiple oiler should be set to feed 6 drops per minute at all outlets. Oil cups on cam shaft should feed 1 drop per minute.)

Tenth—Open cocks for jacket water to cylinder and exhaust.

Eleventh—Open gate valve on fresh-water supply branch and close gate valve on salt water suction (when pumping fresh water).

Twelfth—Close electrically operated valve.

Thirteenth—Open oil cups on pump.

Fourteenth—Charge air tanks.

Note—When two men start engine, one is to attend to hand wheel near top of cylinder, cock for jacket water to cylinders, electrically operated valve and oiling of pump.

Rules and Regulations When in Operation.

Rule 90. First—The number of the fire-alarm signals to which the station will respond are given on the chart on the wall near the signal bell.

Second—Start Engine No. 3 and put on water pressure immediately after receipt of a fire-alarm signal from the protected area.

Third—Pump fresh water with one pump.

Fourth—Pump salt water with additional pump.

Fifth—Start second engine upon receipt of order over the telephone, or in case the pressure is observed to drop appreciably on first pump.

Sixth—Start third engine under same conditions as second.

Seventh—When one pump is running and an order is received over the telephone to decrease the pressure, slow down engine or partially open electrically operated valve by hand.

Eighth—Upon receipt of telephone order to shut down or take off the pressure, open the electrically operated valve and keep engine running light until all air tanks are charged.

Ninth—Close gates on all fresh-water supply branches.

Tenth—Shut down one engine and bring it into starting position.

Eleventh—Shut down second engine and bring it into starting position.

Twelfth—Shut down third engine and bring it into starting position.

Rules to Be Observed When Making Repairs.

Air Supply.

Rule 91. First—If for any reason it is necessary to interfere with the air supply in such a manner that there is any question about being able to supply any one or all

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engines, such engine or engines should be started and run without load, so that the full capacity of the station can be given at any instant; and the engine or engines started should not be stopped until the condition of the air supply is such that there is no question about being able to immediately start up the full plant.

Second—Electric Current. In case of failure of the electric current from any cause, use primary batteries for ignition and turn motor-operated valves by hand.

Third—Pumps and Engines. Never dismantle more than one pump or engine at a time.

Stopping of Pumps.

Rule 92. Pumps when started in response to a fire-alarm signal must be stopped only upon an order from the Fire Department.

First—Shut off exhaust cooling water.

Second—Shut off jacket water to cylinders.

Third—Shut off gas.

Fourth—Shut off oil.

Fifth—Open switches controlling ignition current.

Sixth—Open small cocks on igniters.

Seventh—Turn fly-wheel to starting position.

Eighth—Pull out lever which actuates pawls and allows Cylinder No. 3 to become air cylinder.

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## TABLE No. 1.

Monthly Record of Rainfall at Brooklyn and Vicinity from 1899 to 1909.
(Record Taken at Municipal Building, Brooklyn.)

| Year. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1899..... | 3.73 | 3.74 | 6.13 | 1.65 | 1.14 | 2.34 | 7.08 | 4.48 | 6.13 | 2.07 | 1.64 | 1.98 | 42.11 |
| 1900..... | 4.00 | 5.33 | 3.74 | 1.88 | 4.66 | 3.07 | 5.14 | 2.33 | 3.05 | 3.42 | 4.58 | 1.91 | 43.11 |
| 1901..... | 2.16 | 0.55 | 4.22 | 6.33 | 7.03 | 0.99 | 7.16 | 6.27 | 2.16 | 3.03 | 1.18 | 6.90 | 47.98 |
| 1902..... | 2.50 | 6.02 | 4.31 | 3.39 | 1.20 | 5.87 | 2.69 | 3.68 | 4.19 | 6.49 | 1.69 | 6.44 | 48.47 |
| 1903..... | 3.64 | 3.84 | 4.18 | 3.19 | 0.44 | 8.76 | 3.46 | 6.36 | 2.77 | 12.02 | 1.07 | 2.76 | 52.49 |
| 1904..... | 3.20 | 2.19 | 3.54 | 4.74 | 2.01 | 2.61 | 5.40 | 8.76 | 3.36 | 3.54 | 2.47 | 2.59 | 44.41 |
| 1905..... | 3.24 | 2.64 | 3.85 | 2.61 | 0.83 | 4.92 | 3.97 | 5.40 | 7.17 | 2.61 | 1.69 | 3.49 | 42.42 |
| 1906..... | 2.82 | 2.23 | 5.41 | 5.60 | 5.29 | 1.91 | 3.93 | 3.32 | 3.08 | 5.77 | 1.32 | 4.11 | 44.79 |
| 1907..... | 3.83 | 2.57 | 3.47 | 4.24 | 3.84 | 3.58 | 0.74 | 2.71 | 6.61 | 3.82 | 8.14 | 3.83 | 47.38 |
| 1908..... | 3.72 | 4.67 | 2.30 | 1.79 | 8.70 | 1.96 | 3.72 | 5.70 | 0.89 | 1.93 | 0.75 | 3.21 | 39.34 |

## TABLE No. 2.

Monthly Record of Rainfall at Hempstead Storage Reservoir from 1899 to 1909.

| Year. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1899..... | 4.22 | 5.02 | 7.79 | 1.47 | 1.79 | 2.21 | 5.07 | 3.59 | 5.17 | 2.76 | 2.69 | 1.82 | 43.60 |
| 1900..... | 4.45 | 5.04 | 3.77 | 1.87 | 4.11 | 1.98 | 4.69 | 3.76 | 2.10 | 3.22 | 4.16 | 2.28 | 41.43 |
| 1901..... | 2.21 | 0.77 | 6.97 | 8.05 | 7.17 | 0.55 | 5.93 | 4.03 | 3.36 | 1.95 | 1.28 | 7.65 | 49.92 |
| 1902..... | 2.17 | 4.99 | 5.01 | 3.62 | 1.01 | 6.03 | 2.42 | 3.34 | 5.54 | 8.68 | 2.13 | 7.04 | 51.98 |
| 1903..... | 3.82 | 4.65 | 5.21 | 3.98 | 0.40 | 9.58 | 3.16 | 7.67 | 2.05 | 6.65 | 1.54 | 3.43 | 52.14 |
| 1904..... | 2.97 | 3.56 | 3.58 | 4.24 | 2.44 | 3.77 | 5.03 | 10.76 | 4.58 | 3.38 | 1.87 | 2.44 | 48.62 |
| 1905..... | 2.20 | 3.00 | 4.05 | 3.18 | 1.07 | 3.41 | 2.33 | 4.54 | 4.51 | 2.86 | 1.81 | 3.86 | 36.82 |
| 1906..... | 4.29 | 1.95 | 4.98 | 4.56 | 3.41 | 4.26 | 5.60 | 2.54 | 1.45 | 5.97 | 1.46 | 3.65 | 44.12 |
| 1907..... | 3.29 | 1.77 | 3.27 | 3.67 | 5.11 | 5.93 | 1.65 | 2.72 | 8.32 | 4.10 | 5.28 | 4.12 | 49.23 |
| 1908..... | 3.17 | 4.76 | 2.64 | 2.17 | 5.86 | 0.62 | 3.92 | 4.87 | 0.91 | 1.83 | 0.74 | 2.95 | 34.44 |

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## TABLE No. 3.

### Daily Record of Rainfall at Brooklyn and Vicinity During 1908.

| Day. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1..... | .. | .88 | .13 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1.01 |
| 2..... | .. | .. | .06 | .17 | .. | .. | .. | .. | .. | .. | .. | .. | .23 |
| 3..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 4..... | .03 | .. | .. | .. | .07 | .. | .03 | .. | .. | .. | .. | .02 | .15 |
| 5..... | .02 | .55 | .. | .07 | .. | .. | .. | .31 | .. | .. | .. | .. | .95 |
| 6..... | .. | .. | .28 | .. | .06 | .. | .. | .27 | .78 | .. | .. | .10 | 1.49 |
| 7..... | 1.22 | .. | .. | .01 | 4.20 | .. | .. | .16 | .. | .. | .. | 1.81 | 7.40 |
| 8..... | .. | .. | .22 | .28 | .12 | .. | .. | .. | .. | .. | .. | .. | .62 |
| 9..... | .. | .. | .27 | .. | .01 | .. | .. | .11 | .. | .. | .. | .. | .39 |
| 10..... | .. | .. | .. | .12 | .01 | .. | .. | .. | .. | .12 | .. | .. | .25 |
| 11..... | .. | .. | .. | .. | .. | .. | .. | .31 | .. | .01 | .. | .21 | .53 |
| 12..... | 1.10 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .16 | 1.26 |
| 13..... | .. | .12 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .12 |
| 14..... | .. | .07 | .. | .. | .45 | .. | 1.56 | .. | .. | .. | .51 | .. | 2.59 |
| 15..... | .. | .43 | .11 | .23 | .34 | 1.56 | .. | .. | .. | .. | .15 | .. | 2.82 |
| 16..... | .10 | .. | .. | .. | .. | .29 | .. | .. | .. | .. | .. | .. | .39 |
| 17..... | .. | .. | .. | .. | .. | .. | .. | .06 | .. | .. | .. | .10 | .16 |
| 18..... | .. | .. | .45 | .10 | .. | .. | .. | .. | .. | .. | .09 | .36 | 1.00 |
| 19..... | .. | 1.86 | .34 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2.20 |
| 20..... | .. | .. | .. | .. | .98 | .. | .. | .. | .. | .. | .. | .. | .98 |
| 21..... | .. | .. | .. | .. | .37 | .. | .83 | .. | .. | .. | .. | .. | 1.20 |
| 22..... | .. | .. | .. | .. | 1.00 | .. | .39 | 1.55 | .. | .. | .. | .25 | 3.19 |
| 23..... | .88 | .. | .24 | .. | .. | .. | .07 | .. | .. | .. | .. | .11 | 1.30 |
| 24..... | .18 | .. | .. | .. | .. | .. | .56 | .. | .. | .. | .. | .. | .74 |
| 25..... | .. | .04 | .. | .. | .. | .. | .28 | .10 | .. | .04 | .. | .. | .46 |
| 26..... | .. | .72 | .. | .. | .. | .. | .. | 2.73 | .01 | .82 | .. | .. | 4.28 |
| 27..... | .16 | .. | .. | .. | .. | .. | .. | .10 | .. | .08 | .. | .. | .34 |
| 28..... | .. | .. | .02 | .08 | .. | .. | .. | .. | .10 | .29 | .. | .. | .49 |
| 29..... | .03 | .. | .15 | .. | .. | .. | .. | .. | .. | .54 | .. | .. | .72 |
| 30..... | .. | .. | .03 | .73 | 1.09 | .11 | .. | .. | .. | .03 | .. | .09 | 2.08 |
| 31..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Total.... | 3.72 | 4.67 | 2.30 | 1.79 | 8.70 | 1.96 | 3.72 | 5.70 | 0.89 | 1.93 | 0.75 | 3.21 | 39.34 |

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## TABLE No. 4.

### Daily Record of Rainfall at Hempstead Storage Reservoir During 1908.

| Day. | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1..... | .. | .88 | .06 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .94 |
| 2..... | .. | .. | .18 | .29 | .14 | .. | .. | .. | .. | .. | .. | .. | .61 |
| 3..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 4..... | .06 | .. | .. | .. | .. | .. | .15 | .. | .. | .. | .. | .03 | .24 |
| 5..... | .. | .26 | .. | .09 | .. | .. | .. | .29 | .. | .. | .. | .. | .64 |
| 6..... | .. | .64 | .44 | .. | .. | .. | .. | .46 | .27 | .. | .. | .. | 1.81 |
| 7..... | 1.45 | .. | .. | .. | 2.02 | .. | .. | .38 | .04 | .. | .. | 1.44 | 5.33 |
| 8..... | .. | .. | .21 | .48 | .17 | .. | .. | .. | .. | .. | .. | .. | .86 |
| 9..... | .. | .. | .27 | .03 | .. | .. | .. | .14 | .. | .. | .. | .. | .44 |
| 10..... | .. | .. | .. | .18 | .. | .. | .. | .. | .. | .14 | .. | .. | .32 |
| 11..... | .. | .. | .. | .10 | .. | .. | .. | .27 | .. | .. | .. | .39 | .76 |
| 12..... | .97 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .14 | 1.11 |
| 13..... | .. | .24 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .24 |
| 14..... | .. | .05 | .. | .. | .13 | .. | 1.01 | .. | .. | .. | .47 | .. | 1.66 |
| 15..... | .. | .39 | .08 | .28 | .40 | .30 | .. | .. | .. | .. | .05 | .. | 1.50 |
| 16..... | .20 | .. | .. | .. | .. | .20 | .. | .. | .. | .. | .. | .. | .40 |
| 17..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 18..... | .. | .. | .37 | .23 | .. | .. | .03 | .. | .. | .. | .13 | .58 | 1.34 |
| 19..... | .. | 1.64 | .33 | .. | .. | .. | .20 | .. | .. | .. | .. | .. | 2.17 |
| 20..... | .. | .. | .. | .. | .45 | .. | .. | .. | .. | .. | .. | .. | .45 |
| 21..... | .. | .. | .. | .. | .15 | .. | 1.01 | .. | .. | .. | .. | .. | 1.16 |
| 22..... | .. | .. | .. | .. | .25 | .. | .85 | .48 | .. | .. | .. | .. | 1.58 |
| 23..... | .. | .10 | .36 | .. | .01 | .. | .05 | .. | .. | .. | .. | .05 | .57 |
| 24..... | .15 | .. | .. | .. | .. | .. | .19 | .. | .. | .03 | .. | .. | .37 |
| 25..... | .. | .. | .. | .. | .. | .. | .43 | .09 | .. | .01 | .06 | .. | .59 |
| 26..... | .03 | .56 | .. | .. | .. | .. | .. | 2.47 | .. | .33 | .03 | .. | 3.42 |
| 27..... | .29 | .. | .. | .. | .. | .. | .. | .29 | .. | .12 | .. | .. | .70 |
| 28..... | .. | .. | .02 | .08 | .. | .. | .. | .. | .. | .37 | .. | .. | .47 |
| 29..... | .02 | .. | .24 | .. | .. | .12 | .. | .. | .60 | .67 | .. | .. | 1.65 |
| 30..... | .. | .. | .08 | .41 | 2.14 | .. | .. | .. | .. | .16 | .. | .. | 2.79 |
| 31..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .32 | .32 |
| Total.... | 3.17 | 4.76 | 2.64 | 2.17 | 5.86 | 0.62 | 3.92 | 4.87 | 0.91 | 1.83 | 0.74 | 2.95 | 34.44 |

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TABLE No. 5.

Highest, Lowest, Monthly Range of and Average Temperatures (Degrees Fahrenheit) for Ten Years, Between 8 and 9 O'Clock a. m., at Hempstead Storage Reservoir.

| Year. | January. | | | | February. | | | | March. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. |
| 1899 | 47 | 3 | 44 | 26 | 42 | 5 | 47 | 23 | 47 | 24 | 23 | 36 |
| 1900 | 54 | 12 | 42 | 29 | 51 | 5 | 46 | 27 | 45 | 16 | 29 | 31 |
| 1901 | 40 | 5 | 35 | 29 | 35 | 11 | 24 | 21 | 52 | 12 | 40 | 35 |
| 1902 | 41 | 14 | 27 | 25 | 44 | 11 | 33 | 25 | 52 | 25 | 27 | 40 |
| 1903 | 48 | 10 | 38 | 27 | 49 | 2 | 47 | 28 | 52 | 29 | 23 | 43 |
| 1904 | 45 | 6 | 51 | 19 | 42 | .. | 42 | 18 | 49 | 17 | 32 | 34 |
| 1905 | 46 | .. | 46 | 23 | 34 | 2 | 32 | 20 | 48 | 16 | 32 | 34 |
| 1906 | 50 | 4 | 46 | 33 | 40 | 6 | 34 | 26 | 45 | 16 | 29 | 31 |
| 1907 | 48 | .. | 48 | 28 | 34 | 1 | 33 | 19 | 58 | 14 | 44 | 34 |
| 1908 | 46 | 4 | 42 | 28 | 44 | 3 | 41 | 25 | 50 | 23 | 27 | 38 |
| Average | 47 | 5 | 42 | 27 | 42 | 4 | 38 | 23 | 50 | 19 | 31 | 36 |

| Year. | April. | | | | May. | | | | June. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. |
| 1899 | 63 | 32 | 31 | 46 | 72 | 52 | 20 | 59 | 85 | 63 | 22 | 70 |
| 1900 | 60 | 30 | 30 | 47 | 72 | 43 | 29 | 58 | 80 | 59 | 21 | 69 |
| 1901 | 54 | 39 | 15 | 46 | 70 | 40 | 30 | 57 | 87 | 55 | 32 | 70 |
| 1902 | 60 | 38 | 22 | 48 | 70 | 45 | 25 | 59 | 76 | 62 | 14 | 67 |
| 1903 | 64 | 32 | 32 | 49 | 75 | 45 | 30 | 60 | 74 | 56 | 18 | 63 |
| 1904 | 55 | 28 | 27 | 44 | 72 | 52 | 20 | 61 | 84 | 55 | 29 | 68 |
| 1905 | 59 | 36 | 23 | 45 | 68 | 44 | 24 | 58 | 78 | 51 | 27 | 66 |
| 1906 | 57 | 35 | 22 | 47 | 80 | 46 | 34 | 60 | 80 | 57 | 23 | 68 |
| 1907 | 56 | 29 | 27 | 41 | 63 | 40 | 23 | 51 | 77 | 44 | 33 | 63 |
| 1908 | 61 | 30 | 31 | 46 | 74 | 45 | 29 | 59 | 78 | 64 | 14 | 70 |
| Average | 59 | 33 | 26 | 46 | 72 | 45 | 26 | 58 | 80 | 57 | 23 | 67 |

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| Year. | July. | | | | August. | | | | September. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. |
| 1899 | 80 | 65 | 15 | 71 | 77 | 63 | 14 | 69 | 73 | 48 | 25 | 63 |
| 1900 | 85 | 61 | 24 | 74 | 84 | 65 | 19 | 74 | 79 | 52 | 27 | 68 |
| 1901 | 94 | 64 | 30 | 75 | 78 | 67 | 11 | 73 | 77 | 55 | 22 | 66 |
| 1902 | 81 | 62 | 19 | 71 | 77 | 64 | 13 | 71 | 73 | 53 | 20 | 65 |
| 1903 | 84 | 65 | 19 | 74 | 77 | 60 | 17 | 68 | 74 | 44 | 30 | 62 |
| 1904 | 80 | 66 | 14 | 72 | 76 | 60 | 16 | 70 | 74 | 44 | 30 | 63 |
| 1905 | 85 | 58 | 27 | 74 | 78 | 60 | 18 | 69 | 70 | 49 | 21 | 63 |
| 1906 | 79 | 66 | 13 | 71 | 80 | 64 | 16 | 74 | 78 | 53 | 25 | 67 |
| 1907 | 80 | 67 | 13 | 73 | 76 | 60 | 16 | 68 | 73 | 50 | 23 | 67 |
| 1908 | 83 | 70 | 13 | 75 | 81 | 56 | 25 | 70 | 72 | 56 | 16 | 64 |
| Average | 83 | 64 | 19 | 73 | 78 | 62 | 17 | 71 | 74 | 50 | 24 | 65 |

| Year. | October. | | | | November. | | | | December. | | | | Year. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. | Highest. | Lowest. | Range. | Average. |
| 1899 | 67 | 38 | 29 | 55 | 62 | 25 | 37 | 41 | 56 | 8 | 48 | 33 | 85 | 5 | 90 | 49 |
| 1900 | 69 | 42 | 27 | 57 | 65 | 22 | 43 | 45 | 46 | 12 | 34 | 30 | 85 | 5 | 80 | 51 |
| 1901 | 66 | 43 | 23 | 54 | 55 | 20 | 35 | 37 | 53 | 10 | 43 | 31 | 94 | 5 | 89 | 50 |
| 1902 | 66 | 40 | 26 | 56 | 60 | 30 | 30 | 48 | 48 | 8 | 40 | 29 | 81 | 8 | 73 | 58 |
| 1903 | 68 | 42 | 26 | 54 | 52 | 16 | 36 | 36 | 48 | 10 | 38 | 26 | 84 | 2 | 82 | 50 |
| 1904 | 67 | 33 | 34 | 51 | 46 | 20 | 26 | 37 | 45 | 9 | 36 | 25 | 84 | 6 | 90 | 47 |
| 1905 | 69 | 38 | 31 | 52 | 54 | 21 | 33 | 37 | 54 | 16 | 38 | 32 | 85 | .. | 85 | 48 |
| 1906 | 66 | 41 | 25 | 53 | 57 | 28 | 29 | 40 | 48 | 9 | 39 | 29 | 80 | 4 | 76 | 50 |
| 1907 | 64 | 37 | 27 | 48 | 53 | 28 | 25 | 47 | 53 | 22 | 31 | 32 | 80 | .. | 80 | 48 |
| 1908 | 67 | 40 | 27 | 55 | 56 | 29 | 27 | 40 | 54 | 19 | 35 | 32 | 83 | 3 | 80 | 50 |
| Average. | 67 | 39 | 28 | 54 | 56 | 24 | 32 | 41 | 51 | 12 | 38 | 30 | 84 | 2 | 82 | 50 |

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TABLE No. 6.

Summary of Average Daily Consumption of Water in Brooklyn for Each Month During 1908.

| Month. | Ridgewood and Mount Prospect Low Service. | Mount Prospect High Service. | Gravesend. | New Utrecht. | New Lots. | Sixth Street Pumping Station. | Total. |
|---|---|---|---|---|---|---|---|
| January..... | 121,682,000 | 7,573,000 | 3,191,000 | 1,639,000 | 6,699,000 | 880,000 | 141,664,000 |
| February..... | 127,534,000 | 7,895,000 | 3,289,000 | 1,550,000 | 6,817,000 | 1,666,000 | 148,751,000 |
| March..... | 117,524,000 | 8,355,000 | 3,095,000 | 967,000 | 6,795,000 | 1,964,000 | 138,700,000 |
| April..... | 113,590,000 | 8,138,000 | 3,099,000 | 605,000 | 6,738,000 | 2,258,000 | 134,428,000 |
| May..... | 112,371,000 | 8,469,000 | 3,065,000 | 914,000 | 6,755,000 | 2,274,000 | 133,848,000 |
| June..... | 123,079,000 | 8,210,000 | 3,084,000 | 1,143,000 | 6,858,000 | 2,337,000 | 144,711,000 |
| July..... | 123,941,000 | 8,609,000 | 2,954,000 | 928,000 | 6,912,000 | 2,346,000 | 145,690,000 |
| August..... | 122,680,000 | 8,337,000 | 2,923,000 | 841,000 | 6,847,000 | 2,273,000 | 143,901,000 |
| September..... | 119,929,000 | 8,784,000 | 3,248,000 | 1,095,000 | 6,882,000 | 3,216,000 | 143,154,000 |
| October..... | 117,162,000 | 9,107,000 | 3,619,000 | 1,091,000 | 6,946,000 | 4,647,000 | 142,572,000 |
| November..... | 112,815,000 | 8,948,000 | 3,490,000 | 1,224,000 | 6,996,000 | 5,034,000 | 138,507,000 |
| December..... | 106,057,000 | 8,872,000 | 3,485,000 | 1,458,000 | 7,061,000 | 5,093,000 | 132,026,000 |
| Average for year. | 118,155,311 | 8,443,536 | 3,211,412 | 1,120,025 | 6,858,902 | 2,834,519 | 140,623,705 |

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TABLE

Average Daily Consumption of Water

| Month. | 1899. | 1900. | 1901. |
|---|---|---|---|
| January | 96,502,152 | 92,021,990 | 97,331,371 |
| February | 102,822,950 | 93,875,485 | 93,739,375 |
| March | 95,112,986 | 94,378,811 | 92,016,696 |
| April | 94,003,531 | 91,877,708 | 93,721,383 |
| May | 96,835,982 | 96,114,581 | 95,057,314 |
| June | 99,850,034 | 99,542,241 | 101,784,528 |
| July | 97,763,355 | 99,681,945 | 101,202,273 |
| August | 97,172,481 | 98,384,748 | 97,249,230 |
| September | 96,574,665 | 94,894,169 | 97,011,649 |
| October | 93,787,252 | 88,790,469 | 97,687,658 |
| November | 90,549,242 | 87,047,378 | 95,447,760 |
| December | 89,959,154 | 93,809,556 | 98,124,421 |
| Average | 95,863,571 | 95,605,721 | 96,720,603 |

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No. 7.

from 1899 to 1909, U. S. Gallons.

| 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|---|---|---|---|---|---|---|
| 101,891,184 | 107,828,904 | 116,463,845 | 123,237,196 | 121,617,291 | 134,053,645 | 141,664,000 |
| 103,879,545 | 108,589,023 | 128,156,893 | 129,515,942 | 128,652,179 | 139,757,964 | 148,751,000 |
| 99,806,437 | 105,100,729 | 114,487,613 | 123,601,713 | 126,056,322 | 134,774,419 | 138,687,000 |
| 99,847,690 | 103,025,471 | 106,631,005 | 117,849,604 | 126,262,301 | 134,021,500 | 134,441,000 |
| 101,170,927 | 104,753,479 | 106,506,897 | 121,477,761 | 129,487,194 | 136,560,000 | 133,848,000 |
| 102,174,855 | 100,690,550 | 109,029,548 | 120,343,060 | 134,311,233 | 138,950,367 | 144,711,000 |
| 99,747,124 | 105,159,017 | 108,448,827 | 118,341,819 | 126,298,032 | 139,109,806 | 145,690,000 |
| 97,719,661 | 102,009,011 | 110,330,125 | 114,714,786 | 130,032,775 | 134,972,097 | 143,901,000 |
| 100,325,147 | 108,114,334 | 113,196,405 | 113,991,247 | 132,990,533 | 136,584,267 | 143,154,000 |
| 98,984,798 | 103,691,807 | 112,678,795 | 115,322,139 | 124,663,806 | 134,578,839 | 142,572,000 |
| 96,363,843 | 99,617,300 | 112,930,626 | 114,029,144 | 119,260,367 | 131,541,867 | 138,507,000 |
| 102,019,521 | 108,518,204 | 119,548,389 | 119,053,325 | 125,491,355 | 132,803,194 | 132,026,000 |
| 100,305,485 | 104,747,447 | 113,149,117 | 119,234,968 | 127,068,614 | 135,612,534 | 140,623,705 |

Number of taps in use January 1, 1909, 144,987.

New Utrecht system acquired in 1895.

New Lots system acquired in 1900.

Gravesend system acquired in 1895.

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TABLE No. 8.

Showing Average Maximum and Minimum Daily Consumption of Water, 1908.

| 1908. | Average U. S. Gallons. | Maximum. | | Minimum. | |
|---|---|---|---|---|---|
| | | Date. | U. S. Gallons. | Date. | U. S. Gallons. |
| January..... | 141,664,000 | Thursday, 30th | 160,126,000 | Wednesday, 1st | 126,655,000 |
| February..... | 148,751,000 | Tuesday, 4th | 161,320,000 | Sunday, 23d | 136,677,000 |
| March..... | 138,687,000 | Tuesday, 3d | 145,634,000 | Sunday, 29th | 123,349,000 |
| April..... | 134,441,000 | Wednesday, 29th | 141,330,000 | Sunday, 5th | 123,491,000 |
| May..... | 133,848,000 | Monday, 18th | 149,100,000 | Saturday, 30th | 122,850,000 |
| June..... | 144,711,000 | Monday, 22d | 160,278,000 | Sunday, 7th | 132,479,000 |
| July..... | 145,690,000 | Thursday, 16th | 160,605,000 | Wednesday, 15th | 128,193,000 |
| August..... | 143,901,000 | Tuesday, 4th | 156,161,000 | Sunday, 9th | 129,852,000 |
| September... | 143,154,000 | Monday 14th | 153,882,000 | Sunday, 20th | 130,329,000 |
| October..... | 142,572,000 | Monday, 19th | 151,262,000 | Sunday, 4th | 129,865,000 |
| November..... | 138,507,000 | Monday, 9th | 148,544,000 | Sunday 22d | 128,171,000 |
| December.... | 132,026,000 | Friday, 4th | 145,629,000 | Sunday, 20th | 120,619,000 |
| Average..... | 140,623,705 | | | | |

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TABLE No. 9.

Showing Ratio of the Average Consumption for Each Month to That for Each Year from 1899 to 1909.

| Month. | 1899. | 1900 | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|---|---|---|---|---|---|---|---|---|---|---|
| January ..... | 1.01 | 0.96 | 1.01 | 1.02 | 1.03 | 1.03 | 1.03 | 0.96 | 0.99 | 1.01 |
| February ..... | 1.07 | 0.98 | 0.97 | 1.04 | 1.04 | 1.13 | 1.09 | 1.01 | 1.03 | 1.06 |
| March ..... | 0.99 | 0.99 | 0.95 | 1.00 | 1.00 | 1.01 | 1.04 | 0.99 | 0.99 | 0.99 |
| April ..... | 0.98 | 0.96 | 0.97 | 1.00 | 0.99 | 0.94 | 0.99 | 0.99 | 0.99 | 0.96 |
| May ..... | 1.01 | 1.01 | 0.98 | 1.01 | 1.00 | 0.94 | 1.02 | 1.02 | 1.01 | 0.96 |
| June ..... | 1.04 | 1.04 | 1.05 | 1.02 | 0.96 | 0.96 | 1.01 | 1.05 | 1.02 | 1.03 |
| July ..... | 1.02 | 1.04 | 1.05 | 0.99 | 1.00 | 0.96 | 0.99 | 0.99 | 1.03 | 1.04 |
| August ..... | 1.01 | 1.03 | 1.01 | 0.97 | 0.98 | 0.98 | 0.96 | 1.02 | 0.99 | 1.02 |
| September ..... | 1.01 | 0.99 | 1.00 | 1.00 | 1.03 | 1.00 | 0.96 | 1.04 | 1.01 | 1.02 |
| October ..... | 0.98 | 0.93 | 1.01 | 0.99 | 0.99 | 1.00 | 0.97 | 0.98 | 0.99 | 1.01 |
| November ..... | 0.94 | 0.91 | 0.99 | 0.96 | 0.95 | 1.00 | 0.96 | 0.94 | 0.97 | 0.98 |
| December ..... | 0.94 | 0.98 | 1.01 | 1.02 | 1.04 | 1.06 | 1.00 | 1.03 | 0.98 | 0.94 |

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TABLE

Average Depth and Corresponding Quantity of Water in

| Month. | Mount Prospect Reservoir. | | Hempstead Storage Reservoir. | |
|---|---|---|---|---|
| | Average Depth Feet. | Contents, U. S. Gallons. | Average Depth Feet. | Contents, U. S. Gallons. |
| January | 18.87 | 17,934,600 | 18.21 | 780,742,000 |
| February | 18.69 | 17,737,400 | 18.86 | 831,471,000 |
| March | 20.43 | 19,664,900 | 19.05 | 844,232,000 |
| April | 19.21 | 18,308,500 | 18.98 | 837,847,000 |
| May | 17.23 | 16,158,000 | 18.95 | 834,658,000 |
| June | 18.96 | 18,033,400 | 18.75 | 821,921,000 |
| July | 19.58 | 18,717,700 | 18.32 | 790,216,000 |
| August | 19.34 | 18,452,000 | 18.01 | 764,992,000 |
| September | 18.47 | 17,497,100 | 17.16 | 703,195,000 |
| October | 20.29 | 19,508,500 | 15.17 | 562,038,000 |
| November | 19.60 | 18,739,900 | 14.29 | 502,946,000 |
| December | 19.36 | 18,474,100 | 13.44 | 448,815,000 |
| Average | 19.17 | 18,264,400 | 17.43 | 721,502,000 |

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No. 10.

Ridgewood, Mt. Prospect and Hempstead Storage Reservoirs.

| Ridgewood Reservoirs. | | | | | | Total All Reservoirs. Contents, U. S. Gallons. |
|---|---|---|---|---|---|---|
| Basin No. 1. | | Basin No. 2. | | Basin No. 3. | | |
| Average Depth Feet. | Contents, U. S. Gallons. | Average Depth Feet. | Contents, U. S. Gallons. | Average Depth Feet. | Contents, U. S. Gallons. | |
| 20.55 | 72,795,700 | 20.45 | 84,348,700 | 18.42 | 136,885,500 | 1,092,836,500 |
| 15.26 | 52,939,200 | 15.10 | 60,869,500 | 13.36 | 97,593,500 | 1,060,610,600 |
| 18.82 | 66,296,100 | 18.65 | 76,336,500 | 17.55 | 130,038,700 | 1,136,568,200 |
| 18.14 | 63,715,100 | 17.96 | 73,295,500 | 17.34 | 128,391,700 | 1,120,557,800 |
| 17.47 | 61,185,800 | 17.29 | 70,358,700 | 15.25 | 112,120,000 | 1,094,480,500 |
| 18.88 | 66,524,500 | 18.61 | 76,159,800 | 17.15 | 126,903,400 | 1,109,542,100 |
| 19.17 | 67,630,000 | 18.90 | 77,442,500 | 17.23 | 127,529,800 | 1,081,536,000 |
| 19.64 | 69,427,100 | 19.31 | 79,261,100 | 16.42 | 121,202,100 | 1,053,334,300 |
| 16.77 | 58,557,700 | 16.45 | 66,699,000 | 14.23 | 104,258,100 | 950,206,900 |
| 15.63 | 54,309,400 | 15.29 | 61,686,100 | 13.04 | 95,151,600 | 792,693,600 |
| 14.86 | 51,462,500 | 14.44 | 58,042,800 | 12.37 | 90,055,600 | 721,246,800 |
| 17.10 | 59,794,900 | 16.88 | 68,569,300 | 15.25 | 112,120,000 | 707,773,300 |
| 17.69 | 62,014,800 | 17.44 | 71,014,800 | 15.63 | 115,062,300 | 987,858,300 |

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TABLE

Showing the Total Monthly and Average Daily Pumping at Ridgewood for the Year

Pump

| Month. | Pumping U. S. Gallons. | | | | Drainage Area, Square Miles. | | | *Rainfall During Month, in Inches. |
|---|---|---|---|---|---|---|---|---|
| | Furnished by | | Total. | Average Daily | Old Watershed. | New Watershed. | Total Watershed. | |
| | Old Watershed. | New Watershed. | | | | | | |
| January.... | 1,929,987.000 | 2,035,977,000 | 3,965,964,000 | 127,934,322 | 85.71 | 110.79 | 196.50 | 3.17 |
| February.... | 1,936,993,000 | 1,973,058.000 | 3,910,051,000 | 134 829,345 | ..... | ..... | ..... | 4.76 |
| March..... | 1,898,455,000 | 2,032,746,000 | 3,931,201,000 | 126,812,935 | ..... | ..... | ..... | 2.64 |
| April..... | 1 689.020,000 | 1.967.049,000 | 3,656.075,000 | 121,869,167 | ..... | ..... | ..... | 2.17 |
| May..... | 1,742,237,000 | 1.975,282,000 | 3,717,519,000 | 119,919,968 | ..... | ..... | ..... | 5.86 |
| June..... | 2,115,857,000 | 1,862,798.000 | 3.978,655,000 | 132 621,833 | ..... | ..... | ..... | 0.62 |
| July..... | 2 262,130.000 | 1,852,273,000 | 4.114,403,000 | 132,722,677 | ..... | ..... | ..... | 3.92 |
| August..... | 2 224,075.000 | 1,845,257,000 | 4.069.332,000 | 131,268,774 | ..... | ..... | ..... | 4.87 |
| September.. | 2,127,918.000 | 1.641,292,000 | 3,769,210,000 | 125,640,333 | ..... | ..... | ..... | 0.91 |
| October..... | 2.289,366.000 | 1.625,335.000 | 3,914,701,000 | 126 280,677 | ..... | ..... | ..... | 1.83 |
| November.... | 2,156,386,000 | 1,524,298,000 | 3.680,684.000 | 122,689,467 | ..... | ..... | ..... | 0.74 |
| December... | 2 094,011,000 | 1,513,935,000 | 3,607.946,000 | 116,385,355 | ..... | ..... | ..... | 2.95 |
| Summary for year..... | 24,466,441.000 | 21,849,300,000 | 46,315,741,000 | 126 545,740 | 85.71 | 110.79 | 196.50 | 34.44 |

* Rainfall observed at Hempstead Storage Reservoir.

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No. 11.

1908, Rainfall for Each Month, and Proportion of the Rainfall Corresponding to the ing.

| Water Pumped Expressed in Rainfall in Watershed. | | | | | | Average Yield Utilized per Square Mile of Watershed. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Old. | | New. | | Total. | | U. S. Gallons Daily. | | | Cubic Feet per Second. | | |
| Inches. | Per Cent. | Inches. | Per Cent. | Inches. | Per Cent. | Old. | New. | Total. | Old. | New. | Total. |
| 1.30 | 41.01 | 1.06 | 33.44 | 1.16 | 36.59 | 726,375 | 592,803 | 651,065 | 1.12 | 0.92 | 1.01 |
| 1.30 | 27.31 | 1.02 | 21.43 | 1.15 | 24.16 | 779,289 | 614,103 | 686,154 | 1.20 | 0.95 | 1.06 |
| 1.27 | 48.11 | 1.08 | 40.15 | 1.15 | 43.56 | 714,508 | 591,862 | 645,358 | 1.11 | 0.92 | 1.00 |
| 1.13 | 52.07 | 1.02 | 47.00 | 1.07 | 49.31 | 656,876 | 591,825 | 620,199 | 1.02 | 0.92 | 0.96 |
| 1.17 | 19.97 | 1.03 | 17.58 | 1.09 | 18.60 | 655,713 | 575,131 | 610,280 | 1.01 | 0.89 | 0.94 |
| 1.42 | 229.03 | 0.97 | 156.45 | 1.17 | 188.71 | 822,874 | 560,457 | 674,920 | 1.27 | 0.87 | 1.04 |
| 1.52 | 38.78 | 0.96 | 24.49 | 1.20 | 30.61 | 851,382 | 539,315 | 675,433 | 1.32 | 0.83 | 1.05 |
| 1.49 | 30.60 | 0.96 | 19.71 | 1.19 | 24.43 | 837,059 | 537,272 | 668,034 | 1.29 | 0.83 | 1.03 |
| 1.43 | 157.14 | 0.85 | 93.40 | 1.10 | 120.88 | 827,565 | 493,815 | 639,391 | 1.28 | 0.76 | 0.99 |
| 1.54 | 84.15 | 0.84 | 45.90 | 1.14 | 62.29 | 861,631 | 473,239 | 642,650 | 1.33 | 0.73 | 0.99 |
| 1.45 | 195.95 | 0.79 | 106.76 | 1.08 | 145.95 | 838,636 | 458,615 | 624,374 | 1.30 | 0.71 | 0.97 |
| 1.41 | 47.80 | 0.79 | 26.78 | 1.06 | 35.93 | 788,108 | 440,803 | 592,292 | 1.22 | 0.68 | 0.92 |
| 16.43 | 47.71 | 11.35 | 32.96 | 13.56 | 39.37 | 779,934 | 538,835 | 643,999 | 1.21 | 0.83 | 1.00 |

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TABLE

Record Showing the Amount of Water Delivered at the

| Source of Supply. | Underground Water. | | | |
|---|---|---|---|---|
| | Driven Wells. | | Infiltration Galleries. | |
| | Total for Year. | Average Daily. | Total for Year. | Average Daily. |
| Old Watershed. | | | | |
| Spring Creek | 1,505,857,000 | 4,114,364 | ..... | ..... |
| Woodhaven | 1,125,032,000 | 3,073,858 | ..... | ..... |
| Aqueduct | 1,142,593,000 | 3,121,839 | ..... | ..... |
| Shetucket | 702,431,000 | 1,919,210 | ..... | ..... |
| Oconee | 1,334,343,000 | 3,645,746 | ..... | ..... |
| Morris Park | 800,696,000 | 2,187,694 | ..... | ..... |
| Baiseleys | 316,612,000 | 865,060 | ..... | ..... |
| Baiseleys Filter Plant (Baiseleys Pond) | ..... | ..... | ..... | ..... |
| Jameco | 667,705,000 | 1,824,331 | ..... | ..... |
| Jameco Deep Wells | 2,198,579,000 | 6,007,046 | ..... | ..... |
| St. Albans | 729,606,000 | 1,993,459 | ..... | ..... |
| Springfield | 658,388,000 | 1,798,874 | ..... | ..... |
| Springfield Filter Plant (Springfield Pond) | ..... | ..... | ..... | ..... |
| Rosedale | 973,558,000 | 2,659,995 | ..... | ..... |
| Forest Stream | 1,663,052,000 | 4,543,858 | ..... | ..... |
| Forest Stream Filter Beds (Conselyea Pond) | ..... | ..... | ..... | ..... |
| Clear Stream | 1,224,442,000 | 3,345,470 | ..... | ..... |
| Watts Pond | 857,282,000 | 2,342,301 | ..... | ..... |
| Watts Pond (pond only) | ..... | ..... | ..... | ..... |
| Lynbrook | 219,457,000 | 599,609 | ..... | ..... |
| Queens County Water Company contract | 1,152,532,000 | 3,148,994 | ..... | ..... |
| Smiths Pond | ..... | ..... | ..... | ..... |
| Hempstead Filter Beds (Horse Brook) | ..... | ..... | ..... | ..... |
| Supply ponds, gravity | ..... | ..... | ..... | ..... |
| New Watershed. | | | | |
| Agawam | 420,604,000 | 1,149,191 | ..... | ..... |
| Merrick | 612,408,000 | 1,673,246 | ..... | ..... |
| Matowa | 475,437,000 | 1,299,008 | ..... | ..... |
| Wantagh | 8,206,000 | 22,421 | ..... | ..... |
| Wantagh Infiltration Gallery | ..... | ..... | 3,009,797,000 | 8,223,489 |
| Seaford | ..... | ..... | 4,888,000 | 13.355 |
| Massapequa | 60,498,000 | 165,295 | ..... | ..... |
| Massapequa Infiltration Gallery | ..... | ..... | 5,473,630,000 | 14,955,273 |
| Supply ponds, gravity | ..... | ..... | ..... | ..... |
| Total | 18,849,318,000 | 51,500,869 | 8,488,315,000 | 23,192,117 |

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No. 12.

Ridgewood Pumping Station from Each Source During 1908.

| Surface Water. | | | | | | Total U. S. Gallons Delivered During Year. | Average U.S.Gallons Delivered per Day. |
|---|---|---|---|---|---|---|---|
| Pond Pumping | | Filter Plants. | | Gravity. | | | |
| Total for Year. | Average Daily. | Total for Year. | Average Daily. | Total for Year. | Average Daily. | | |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,505,857,000 | 4,114,364 |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,125,032,000 | 3,073,858 |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,142,593,000 | 3,121,839 |
| ..... | ..... | ..... | ..... | ..... | ..... | 702,431,000 | 1,919,210 |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,334,343,000 | 3,645,746 |
| ..... | ..... | ..... | ..... | ..... | ..... | 800,696,000 | 2,187,694 |
| ..... | ..... | ..... | ..... | ..... | ..... | 316,612,000 | 865,060 |
| ..... | ..... | 1,021,583,000 | 2,791,210 | ..... | ..... | 1,021,583,000 | 2,791,210 |
| ..... | ..... | ..... | ..... | ..... | ..... | 667,705,000 | 1,824,331 |
| ..... | ..... | ..... | ..... | ..... | ..... | 2,198,579,000 | 6,007,046 |
| ..... | ..... | ..... | ..... | ..... | ..... | 729,606,000 | 1,993,459 |
| ..... | ..... | ..... | ..... | ..... | ..... | 658 388,000 | 1,798,874 |
| ..... | ..... | 303,034,000 | 827,962 | ..... | ..... | 303,034,000 | 827,962 |
| ..... | ..... | ..... | ..... | ..... | ..... | 973,558,000 | 2,659,995 |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,663,052,000 | 4,543.858 |
| ..... | ..... | 230,187,000 | 628,926 | ..... | ..... | 230,187,000 | 628,926 |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,224,442,000 | 3,345,470 |
| ..... | ..... | ..... | ..... | ..... | ..... | 857,282,000 | 2,342,301 |
| 668,631,000 | 1,826,861 | ..... | ..... | ..... | ..... | 668,631,000 | 1,826,861 |
| ..... | ..... | ..... | ..... | ..... | ..... | 219,457,000 | 599,609 |
| ..... | ..... | ..... | ..... | ..... | ..... | 1,152,532,000 | 3,148,994 |
| 2,903,213,000 | 7,932,276 | ..... | ..... | ..... | ..... | 2,903,213,000 | 7,932,276 |
| ..... | ..... | 28,559,000 | 78,030 | ..... | ..... | 28,559,000 | 78,030 |
| ..... | ..... | ..... | ..... | 2,039,069,000 | 5.571,227 | 2,039,069,000 | 5,571,227 |
| ..... | ..... | ..... | ..... | ..... | ..... | 420,604,000 | 1,149,191 |
| ..... | ..... | ..... | ..... | ..... | ..... | 612,408,000 | 1,673,246 |
| ..... | ..... | ..... | ..... | ..... | ..... | 475,437,000 | 1,299,008 |
| ..... | ..... | ..... | ..... | ..... | ..... | 8,206,000 | 22,421 |
| ..... | ..... | ..... | ..... | ..... | ..... | 3,009,797,000 | 8,223,489 |
| ..... | ..... | ..... | ..... | ..... | ..... | 4,888,000 | 13,355 |
| ..... | ..... | ..... | ..... | ..... | ..... | 60,498,000 | 165,295 |
| ..... | ..... | ..... | ..... | ..... | ..... | 5,473,630,000 | 14,955,273 |
| ..... | ..... | ..... | ..... | 11,783,832,000 | 32,196,262 | 11,783,832,000 | 32,196,262 |
| 3,571,844,000 | 9,759,137 | 1,583,363,000 | 4,326,128 | 13,822,901,000 | 37,767,489 | 46,315,741,000 | 126,545,740 |

Percentage of underground water to total supply = 59.02.

Percentage of filtered water to toaal supply = 3.42.

Percentage of unfiltered water to total supply = 37.56.

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TABLE

Water Mains Laid and Removed and Gates and

| | 48" | 42" | 36" | 30" | 24" | 20" |
|---|---|---|---|---|---|---|
| Total mains laid to December 31, 1907... | 144,009 | 13 | 60,184 | 68,578 | 38,557 | 304,114 |
| During 1908 ..... | 214 | .. | 168 | 15,268 | 134 | 4,612 |
| Total to December 31, 1908..... | 144,223 | 13 | 60,352 | 83,846 | 38,691 | 308,726 |
| Removed during 1908..... | ..... | .. | ..... | 41 | 10 | 95 |
| Total feet to December 31, 1908. | 144,223 | 13 | 60,352 | 83,805 | 38,681 | 308,631 |
| Total miles to December 31, 1908. | 27.315 | .002 | 11.430 | 15.872 | 7.326 | 58.453 |
| Total gates set to December 31, 1907..... | 18 | .. | 38 | 69 | 69 | 507 |
| During 1908 ..... | 6 | .. | 3 | 2 | 3 | 16 |
| Total to December 31, 1908..... | 24 | .. | 41 | 71 | 72 | 523 |
| Removed during 1908..... | .... | .. | .... | .... | .... | .... |
| Net total, 1908..... | 24 | .. | 41 | 71 | 72 | 523 |

* Feet. † Miles. ‡ Hydrants.

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No. 13.

Hydrants Set and Removed to December 31, 1908.

| 16" | 14" | 12" | 10" | 8" | 6" | 4" | Total. | Total. |
|---|---|---|---|---|---|---|---|---|
| 132,446 | 3,159 | 476,834 | 19,601 | 1,103,934 | 2,049,715 | 55,582 | *4,456,726 | †844.077 |
| 41,404 | .... | 15,432 | ..... | 66,878 | 14,429 | ..... | *158,539 | †30.026 |
| 173,850 | 3,159 | 492,266 | 19,601 | 1,170,812 | 2,064,144 | 55,582 | *4,615,265 | †874.103 |
| 11 | .... | 165 | ..... | 3,527 | 47,972 | ..... | *51,821 | †9.815 |
| 173,839 | 3,159 | 492,101 | 19,601 | 1,167,285 | 2,016,172 | 55,582 | *4,563,444 | †864.288 |
| 32.924 | .598 | 93.201 | 3.712 | 221.077 | 381.851 | 10.527 | ..... | †864.288 |
| 273 | 1 | 996 | 8 | 2,816 | 7,017 | 101 | 11,913 | ‡11,814 |
| 192 | .... | 91 | .... | 412 | 1,557 | .... | 2,282 | ‡1,414 |
| 465 | 1 | 1,087 | 8 | 3,228 | 8,574 | 101 | 14,195 | ‡13,228 |
| .... | .... | .... | .... | 8 | 98 | .... | 106 | ‡90 |
| 465 | 1 | 1,087 | 8 | 3,220 | 8,476 | 101 | 14,089 | ‡13,138 |

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TABLE No. 14.

High Pressure Fire Service Mains Laid, Gates and Hydrants Set to December 31, 1908.

| | 20" | 16" | 12" | 8" | Total. | Total. |
|---|---|---|---|---|---|---|
| Total mains laid to December 31, 1907 | 25,818 | 36,305 | 55,007 | 4,285 | *121,415 | †22.995 |
| During 1908 ..... | .... | ..... | ..... | .... | ..... | ..... |
| Total to December 31, 1908.. | 25,818 | 36,305 | 55,007 | 4,285 | *121,415 | †22.995 |
| Total gates set to December 31, 1907. | 69 | 107 | 145 | 756 | 1,077 | ‡774 |
| During 1908 ..... | .... | .... | .... | .... | ..... | .... |
| Total to December 31, 1908.. | 69 | 107 | 145 | 756 | *1,077 | ‡774 |

* Feet. † Miles. ‡ Hydrants.

TABLE

Water Mains Laid, Gates and

Avenue I, between East Thirteenth street and Coney Island avenue.....
Avenue S, between West Sixth street and West Tenth street.....
Avenue J, between Coney Island avenue and Ocean parkway.....
Atlantic avenue, between Euclid street and Railroad avenue.....
Atlantic avenue, between Shepherd avenue and Essex street.....
Bay Nineteenth street, between Cropsey avenue and bay.....
Benson avenue, between Eighteenth avenue and Bay Eleventh street.....
Belmont avenue, between Warwick street and Schenck avenue.....
Belmont avenue, between Van Siclen avenue and Miller avenue.....
Belmont avenue, between Thatford avenue and Rockaway avenue.....
Berriman street, between Atlantic avenue and Liberty avenue.....
Butler place, between Plaza street and Sterling place.....
Butler street ,between Bond street and Nevins street.....
Bedford avenue, between Division avenue and North Twelfth street.....
Bogart street, between Scholes street and Meserole avenue.....
Clinton place, between Crescent street and end.....
Carroll street, between Nostrand avenue and Rogers avenue.....
Crown street, between Nostrand avenue and Rogers avenue.....

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No. 15.

Hydrants Set During 1908.

| Linear Feet of Pipe Laid. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 48" | 36" | 30" | 24" | 20" | 16" | 12" | 8" | 6" |
| .... | .... | .... | .... | .... | .... | .... | 492 | 19 |
| .... | .... | .... | .... | .... | .... | .... | 1,125 | 34 |
| .... | .... | .... | .... | .... | .... | 1,581 | .... | 32 |
| .... | .... | .... | .... | .... | .... | .... | 1,260 | 45 |
| .... | .... | .... | .... | .... | .... | .... | 263 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 300 | 13 |
| .... | .... | .... | .... | .... | .... | .... | 1,940 | 53 |
| .... | .... | .... | .... | .... | .... | .... | 764 | 20 |
| .... | .... | .... | .... | .... | .... | .... | 226 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 290 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 785 | 17 |
| .... | .... | .... | .... | .... | .... | .... | 479 | 14 |
| .... | .... | .... | .... | .... | .... | .... | .... | 108 |
| .... | .... | .... | .... | 12 | 5,411 | 26 | 1,132 | 350 |
| .... | .... | .... | .... | .... | .... | .... | 280 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 254 | 7 |
| .... | .... | .... | .... | .... | .... | .... | 745 | 26 |
| .... | .... | .... | .... | .... | .... | 26 | 749 | 27 |

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Cropsey avenue, between Bay Eighth street and Fifteenth avenue.....
Cornelia street, between Knickerbocker and Irving avenues.....
Dumont avenue, between Snedeker avenue and Vesta avenue.....
Dumont avenue, between Wyona street and Sheffield street.....
Dumont avenue, between Hendrix street and Van Siclen avenue.....
Dumont avenue, between Ashford street and Warwick street.....
Delmonico place, between Flushing avenue and Park avenue.....
Dock street, to foot of street.....
Dewey place, at Atlantic avenue.....
East Second street, from Avenue J to Avenue K.....
East Eighth street, between Avenue I and Avenue K.....
East Sixteenth street, at Avenue Y.....
East Eighteenth street, from Avenue N to Avenue O.....
East Eighteenth street, between Voorhies avenue and Jerome avenue.....
East Nineteenth street, between Voorhies avenue and Jerome avenue.....
East Twenty-first street, at Jerome avenue.....
East Twenty-second street, between Voorhies avenue and Jerome avenue.....
East Twenty-seventh street, between Avenue Z and Voorhies lane.....
East Twenty-seventh street, from Kings highway to Avenue N.....
East Twenty-eighth street, from Avenue Z to Voorhies lane.....
Eighth avenue, between Thirty-ninth and Forty-first streets.....
Eighth avenue, at Twelfth street .....
Eleventh avenue, between Coney Island and Gravesend avenues.....
Eighteenth street, from Eleventh avenue to 200 feet west.....
Eighty-third street, between Second avenue and Shore road.....
Eighty-ninth street, between Second avenue and Third avenue.....
Elton street, between Glenmore and Pitkin avenues.....
Euclid avenue, between Atlantic avenue and Fulton street.....
Etna street, between Dresden street and Richmond street.....
Eastern parkway, from Sterling place to St. Johns place.....
Eastern parkway, between Bedford and Franklin avenues.....
Eldert street, between Knickerbocker avenue and city line.....
Fourth avenue and Sixth street, west to pumping station.....
Fifth avenue and Sixth street, west to Forty-fourth street.....
Fourteenth avenue, between Forty-second and Forty-third streets.....
Forty-first street, between New Utrecht and Ninth avenues.....
Fiftieth street, between Eighth and Ninth avenues.....

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| Gates Set. | | | | | | | | | Hydrants Set. |
|---|---|---|---|---|---|---|---|---|---|
| 48" | 36" | 30" | 24" | 20" | 16" | 12" | 8" | 6" | |
| .... | .... | .... | .... | .... | .... | 1 | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | 2 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 5 | 5 |
| .... | .... | .... | .... | .... | .... | .... | .... | 3 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | 3 | .... | 6 | 6 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... |
| .... | .... | .... | .... | .... | .... | .... | 2 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 3 | 8 | 8 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 2 | 5 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 3 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 1 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 7 | .... | 5 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 4 | 2 |
| .... | .... | .... | .... | .... | 1 | .... | .... | 3 | .... |
| .... | .... | .... | .... | .... | 2 | .... | 2 | 5 | 5 |
| .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... |
| .... | .... | .... | .... | .... | .... | 6 | .... | 11 | 11 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 9 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 3 | 3 |
| .... | .... | .... | .... | 5 | .... | .... | ..... | .... | .... |

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Fifth avenue and Sixth street, west to Forty-fourth street.....
Fourteenth avenue, between Forty-second and Forty-third streets.....
Forty-first street, between New Utrecht and Ninth avenues.....
Fiftieth street, between Eighth and Ninth avenues.....
Fifteenth street, across Ninth avenue plaza.....
Fifty-third street, between Seventh and Eighth avenues.....
Fifty-sixth street, between First and Second avenues.....
Fifty-ninth street, between Sixth and Seventh avenues.....
Fulton street, between Hemlock street and Lincoln avenue.....
Forbell avenue, from Magenta street to 280 feet south.....
Grand street extension, between Grand and Havemeyer streets.....
Georgia avenue, from New Lots road to Hageman avenue.....
Greenpoint avenue, between Oakland and Leonard streets .....
Gravesend, Pumping Station .....
Howard avenue, between Blake and Dumont avenues.....
Harrison avenue, between Walton street and Division avenue.....
Humboldt street, between Metropolitan and Meeker avenues.....
Huron street, between Oakland and Provost streets.....
Jardine place, from Crescent street to end.....
Junius street, between Lott and Newport avenues.....
Johnson avenue, between Union avenue and White street.....
Joralemon street, at Hicks street.....
Jerome street, south of Atlantic avenue.....
Kings highway, between East Twenty-third and East Thirty-first streets.....
Keap street, between Division and Union avenues.....
Livonia avenue, between Thatford street and Rockaway avenue.....
Lincoln place, between Troy and Schenectady avenues.....
Lott avenue, between Powell and Junius streets.....
Lorimer street, between Broadway and Newton street.....
Morgan avenue, between Meeker avenue and Lombardy street.....
Magenta street, between Enfield street and Forbell avenue.....
Manhattan avenue, between Broadway and Newton street.....
Manhattan avenue, at Newtown Creek.....
Meserole avenue, between Guernsey and Diamond streets.....
Meserole avenue, between Bushwick avenue and Waterbury street.....
Meserole street, between Bogart and Waterbury streets.....
Myrtle avenue, from Cypress avenue to Trotting Course lane.....

Digitized by Google

| Gates Set. | | | | | | | | | Hydrants Set. |
|---|---|---|---|---|---|---|---|---|---|
| 48" | 36" | 30" | 24" | 20" | 16" | 12" | 8" | 6" | |
| .... | .... | .... | .... | .... | .... | 3 | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 1 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 4 | 11 | 11 |
| .... | .... | .... | .... | .... | .... | .... | .... | 4 | 4 |
| .... | .... | .... | .... | 1 | .... | .... | .... | 5 | 4 |
| .... | .... | .... | .... | .... | 1 | 2 | .... | 6 | .... |
| .... | .... | .... | .... | .... | .... | .... | 2 | 3 | 3 |
| .... | .... | .... | .... | 1 | 11 | .... | 11 | 16 | 14 |
| .... | .... | .... | .... | 5 | 2 | 2 | 11 | 10 | 10 |
| .... | .... | .... | .... | .... | .... | .... | .... | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 3 |
| .... | .... | 1 | .... | .... | 18 | 1 | 7 | 25 | 25 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | 2 | 1 |
| .... | .... | .... | .... | .... | .... | 4 | .... | 12 | 12 |
| .... | .... | .... | .... | .... | 13 | 2 | 17 | 20 | 20 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 5 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| .... | .... | .... | .... | .... | 27 | 4 | 27 | 45 | 43 |
| .... | .... | .... | .... | .... | .... | 1 | .... | .... | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| .... | .... | .... | .... | .... | 41 | 4 | 34 | 50 | 50 |
| .... | .... | .... | .... | .... | .... | .... | .... | 2 | 2 |
| .... | .... | .... | .... | .... | 2 | 10 | 10 | 13 | 13 |
| .... | .... | .... | .... | .... | 5 | .... | 3 | 6 | 5 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |

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Ninetieth street, between Third and Fifth avenues.....
Narrows avenue, between Seventy-first and Seventy-third streets.....
New Jersey avenue, between New Lots road and Hageman avenue.....
Nassau avenue, between Guernsey street and Meeker avenue.....
New Lots road, at Vesta avenue.....
Ovington avenue, between Fifth and Stewart avenues.....
One Hundredth street, between Fort Hamilton and Third avenues.....
Oakland street, between Box street and Driggs avenue.....
Park place, between Bristol street and Hopkinson avenue.....
Park place, between Eastern parkway and Saratoga avenue.....
Prospect place, between Albany and Troy avenues.....
Powell street, between Lott avenue and New Lots road.....
Provost street, between Greenpoint avenue and Huron street.....
Riverdale avenue, between Thatford street and Rockaway avenue.....
Ridgewood avenue, between Nichols and Grant avenues.....
Ridgewood avenue, between Enfield street and Grant avenue.....
Ridgewood Pumping Station .....
Sixth avenue, between Sixty-ninth street and Seventy-second street.....
Seventh avenue, between Fifty-third and Fifty-fourth streets.....
Seventh avenue, between Forty-sixth and Forty-ninth streets.....
Sixth street, between Fourth and Fifth avenues.....
Sixty-third street, between Sixteenth and Eighteenth avenues.....
Sixty-seventh street, between Eighteenth and Nineteenth avenues.....
Seventieth street, from Narrows avenue to 266 feet east.....
Seventy-second street, between Seventh and Fort Hamilton avenues.....
Seventy-second street, between Seventeenth and Eighteenth avenues.....
Seventy-fourth street, between Fourth and Fifth avenues.....
Seventy-seventh street, between Seventeenth and Eighteenth avenues.....
Seventy-eighth street, between Nineteenth and Twentieth avenues.....
Sutter avenue, between Rockaway avenue and Bristol street.....
Sutter avenue, between Linwood street and Elton street.....
Snediker avenue, between Livonia and Dumont avenues.....
Shepherd avenue, between Belmont and Sutter avenues.....
Schenck avenue, between New Lots road and Vienna avenue.....
Sterling place, between Saratoga avenue and Howard avenue.....
Scholes street, between Bushwick and Morgan avenues.....
Third avenue, between Seventy-seventh and Seventy-eighth streets.....

Digitized by Google

| Gates Set. | | | | | | | | | Hydrants Set. |
|---|---|---|---|---|---|---|---|---|---|
| 48″ | 36″ | 30″ | 24″ | 20″ | 16″ | 12″ | 8″ | 6″ | |
| .... | .... | .... | .... | .... | .... | .... | 4 | 6 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 4 | 4 |
| .... | .... | .... | .... | .... | 2 | 29 | 27 | 39 | 38 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... |
| .... | .... | .... | .... | .... | .... | .... | 2 | 6 | 6 |
| .... | .... | .... | .... | .... | .... | .... | 4 | 6 | 6 |
| .... | .... | .... | .... | .... | 17 | 2 | 22 | 39 | 34 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 5 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| .... | .... | .... | .... | 3 | .... | .... | 2 | 8 | 8 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| 6 | 3 | 1 | 3 | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 2 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | 2 | 3 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | 4 | 9 | 9 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 3 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 4 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 3 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 3 | 3 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 4 | 7 | 7 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 3 | 3 |
| .... | .... | .... | .... | .... | 7 | .... | 1 | 14 | 14 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |

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| | |
|---|---|
| Third avenue, between Eighty-ninth and Ninetieth streets | |
| Twelfth avenue, between Fortieth and Forty-first streets | |
| Thirteenth avenue, between Fortieth and Forty-second streets | |
| Twentieth avenue, between Seventy-eighth and Seventy-ninth streets | |
| Twentieth street, west of Terrace place | |
| Thirty-ninth street, between Tenth and Fort Hamilton avenues | |
| Trotting Course lane, between Myrtle avenue and Long Island Railroad | |
| Union street, between Utica and Rochester avenues | |
| Vanderbilt avenue, at Atlantic avenue | |
| West Seventh street, between Avenue R and Avenue S | |
| West Thirtieth street, between Surf avenue and Edward place | |
| West Thirtieth street, between Railroad and Mermaid avenues | |
| West Thirty-second street, between Mermaid and Surf avenues | |
| West Thirty-second street, south of Surf avenue | |
| West Thirty-sixth street, between Canal and Neptune avenues | |
| Watkins avenue, between Liberty and East New York avenues | |
| Waterbury street, between Meserole and Stagg streets | |
| White street, between Johnson and Flushing avenues | |
| Miscellaneous | |
| Total | |

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| Gates Set. | | | | | | | | | Hydrants Set. |
|---|---|---|---|---|---|---|---|---|---|
| 48" | 36" | 30" | 24" | 20" | 16" | 12" | 8" | 6" | |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | 1 | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 |
| .... | .... | .... | .... | .... | .... | .... | .... | 3 | 2 |
| .... | .... | .... | .... | .... | .... | .... | 2 | 4 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | 2 | 1 |
| .... | .... | .... | .... | .... | .... | .... | .... | 4 | 3 |
| .... | .... | .... | .... | .... | .... | .... | .... | 6 | 4 |
| .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 |
| .... | .... | .... | .... | .... | .... | .... | .... | 5 | 3 |
| .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 1 |
| .... | .... | .... | .... | .... | 3 | .... | .... | 5 | 4 |
| .... | .... | .... | .... | .... | 9 | .... | 9 | 15 | 15 |
| .... | .... | .... | .... | 1 | 6 | 10 | 39 | 851 | 735 |
| 6 | 3 | 2 | 3 | 16 | 192 | 91 | 412 | 1,557 | 1,414 |

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TABLE No. 16.

Showing Net Amount of Water Filtered at the Baiseleys and Springfield Filter Plants and at the Forest Stream and Hempstead Filter Beds, and Cost of Filtration per Million Gallons During 1908.

| Filter. | Net Amount of Filtered Water, U. S. Gallons. | Cost of Filtration. | | | | | Cost Per Million Gallons. |
|---|---|---|---|---|---|---|---|
| | | Operation and Inspection. | Laboratory. | Repairs. | Interest and Sinking Fund. | Total. | |
| Baisleys ..... | 1,021,580,410 | $6,439 48 | $977 25 | $2,632 00 | $3,218 00 | $13,266 73 | $12 98 |
| Springfield..... | 303,034,440 | 2,090 34 | 488 62 | 53 00 | 1,380 00 | 4,011 96 | 13 24 |
| Forest Stream.... | 230,187,140 | 581 50 | 488 63 | ..... | 1,200 00 | 2,270 13 | 9 86 |
| *Hempstead..... | ..... | ..... | ..... | ..... | ..... | ..... | .... |

*Only in commission for less than one month. No figures.

The large increase in cost of filtration per million gallons at Forest Stream is due to the fact that the beds were out of commission the large part of the year. The same cause explains the high rate at Springfield.

TABLE

Showing Average Results of Analyses of Raw and Filtered

| Plants. | Number of Samples Analyzed. | | Average Bacteria Removal. | Av. Alkalinity Parts Per Mill. Calc. Carb. | | Av. Turbidity Silica Standard. | |
|---|---|---|---|---|---|---|---|
| | Raw Water. | Filtered Water. | | Raw Water. | Filtered Water. | Raw Water. | Filtered Water. |
| Baiseleys ..... | 366 | 1,098 | 97.8% | 31 | 24 | 23 | .... |
| Springfield ..... | 140 | 140 | 98.1% | 16 | 10 | 13 | .... |
| Forest Stream ..... | 54 | 54 | 99.6% | .... | .... | 11 | .... |
| Hempstead ..... | 19 | 76 | 99.9% | .... | .... | 30 | .... |

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No. 17.

Water at the Various Filter Plants for the Year 1908.

| Average Color Plat. Standard. | | Percentage of Samples in Which Positive Tests for B. Coli. Were Obtained. | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0.1 cc. | | 1.0 cc. | | 10. cc. | |
| Raw Water. | Filtered Water. | Raw Water. | Filtered Water. | Raw Water. | Filtered Water. | Raw Water. | Filtered Water. |
| 31 | 1 | 6.01% | .... | 30.87% | .... | 94.26% | 5.46% |
| 20 | .... | 1.43% | .... | 17.14% | .... | 80.72% | 1.43% |
| 17 | 5 | ..... | .... | 22.22% | .... | 87.04% | ..... |
| 12 | 5 | 31.58% | .... | 73.68% | .... | 100.0 % | ..... |

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TABLE No. 18.

Showing Average Quality of the Water for the Years 1907 and 1908 from the Two Ridegwood Reservoirs.

| | 1907. | 1908. |
|---|---|---|
| Physical Examination— | | |
| Turbidity | 3. | 2. |
| Color | 13. | 10. |
| Per cent. of samples with distinct vegetable odors | 0.1 | 0. |
| Per cent. of samples with odors of decomposition | 0.3 | 0.8 |
| Per cent. of samples with odors due to organisms | 0. | 0. |
| Chemical Examination— | | |
| Albuminoid Ammonia | 0.037 | 0.030 |
| Free Ammonia | 0.028 | 0.021 |
| Nitrites | 0.003 | 0.003 |
| Nitrates | 1.57 | 1.45 |
| Total solids | 86. | 91. |
| Chlorine | 9.3 | 10.8 |
| Hardness | 32. | 34. |
| Alkalinity | 16. | 18. |
| Iron | 0.53 | 0.52 |
| Microscopical Examination— | | |
| Microscopic organisms | 154. | 22. |
| Amorphous matter | 369. | 255. |
| Bacteriological Examination— | | |
| Bacteria per cc | 154. | 274. |
| Per cent. of Positive Tests for B. coli: | | |
| In 0.1cc. | 0.1 | 1.5 |
| In 1.0cc. | 2.6 | 10.6 |
| In 10.0cc. | 41.1 | 40.6 |

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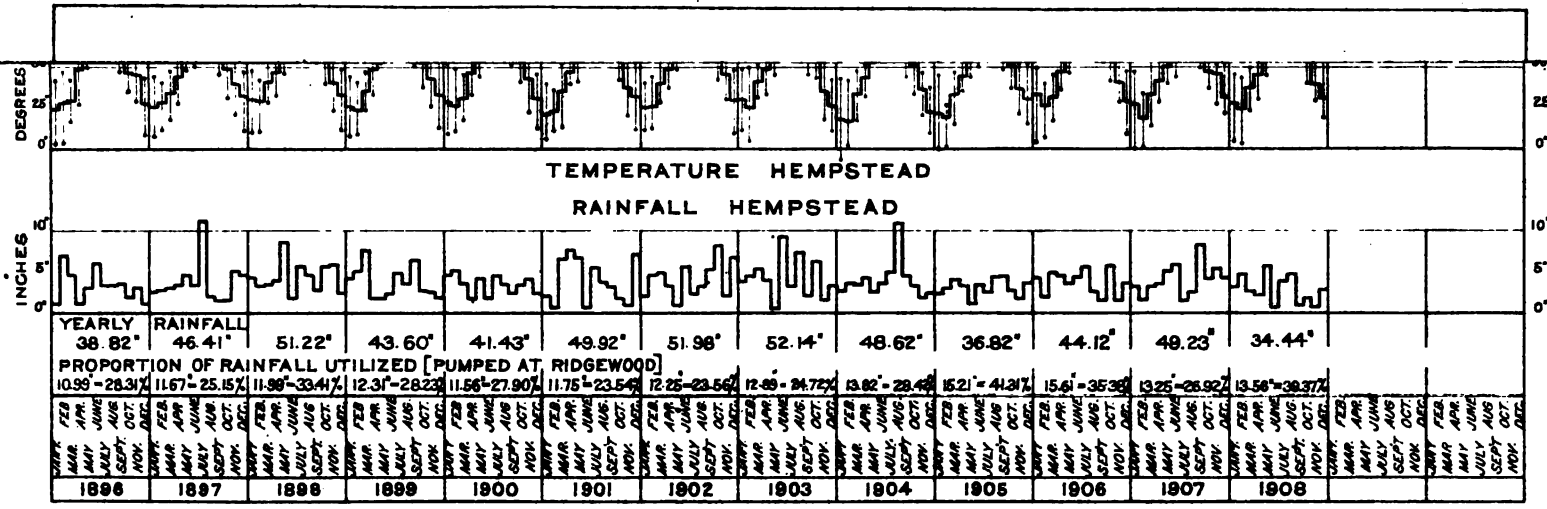
DIAGRAM Nº 1




CITY OF NEW YORK, BOROUGH OF BROOKLYN
DEPARTMENT OF WATER SUPPLY, GAS & ELECTRICITY
DIAGRAM SHOWING
CONTENTS AND CONSUMPTION IN U.S. GALLONS
TOGETHER WITH RAINFALL & TEMPERATURE RECORDS FROM
1896 TO 1908 INCLUSIVE

TO ACCOMPANY ANNUAL REPORT

Drawn by Gleth
Checked by Morrison & Cook

PLATE Nº 4379 - FILE K-6

22,541 H.

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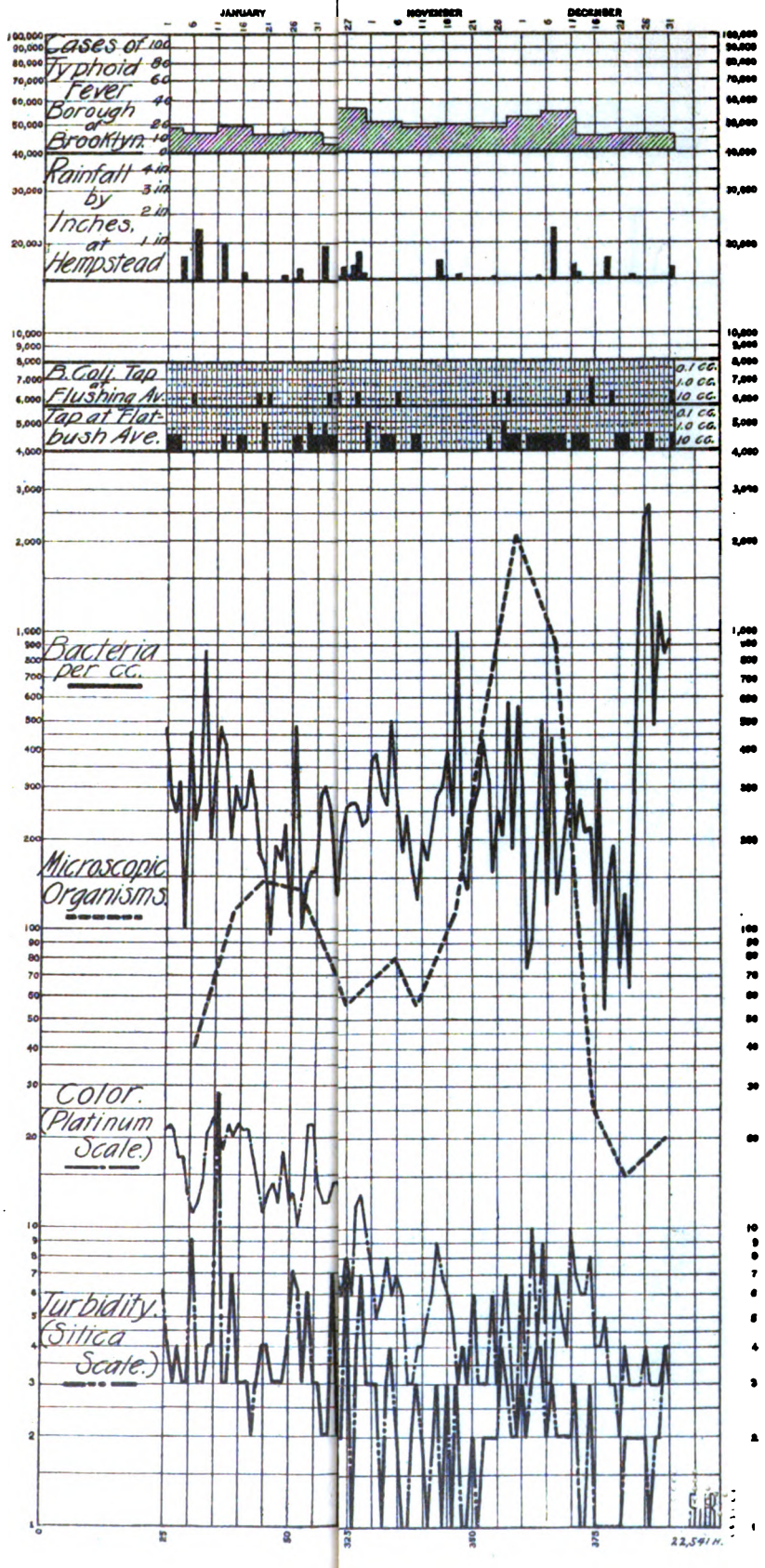


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TABLE No. 19.

Showing Average Quality of the Water for the Years 1907 and 1908 from the Taps at Flatbush and Seventh Avenues, and at Flatbush and Clermont Avenues.

| | 1907. | 1908. |
|---|---|---|
| Physical Examination— | | |
| Turbidity | 3. | 3. |
| Color | 12. | 9. |
| Per cent. of samples with distinct vegetable odors | 0.4 | 0. |
| Per cent. of samples with odors of decomposition | 0.8 | 1.9 |
| Per cent. of samples with odors due to organisms | 0.3 | 0.3 |
| Chemical Examination— | | |
| Albuminoid Ammonia | 0.044 | 0.039 |
| Free Ammonia | 0.012 | 0.009 |
| Nitrites | 0.003 | 0.003 |
| Nitrates | 1.56 | 1.61 |
| Microscopical Examination— | | |
| Microscopic organisms | 449. | 171. |
| Amorphous matter | 370. | 479. |
| Bacteriological Examination— | | |
| Bacteria per cc | 143. | 264. |
| Per cent. of Positive Tests for B. coli: | | |
| In 0.1cc. | 0. | 1. |
| In 1.0cc. | 1.4 | 6.3 |
| In 10.0cc. | 25.1 | 32.7 |

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High-pressure Fire Service Station, Furman and Joralemon Streets, Brooklyn, N. Y.

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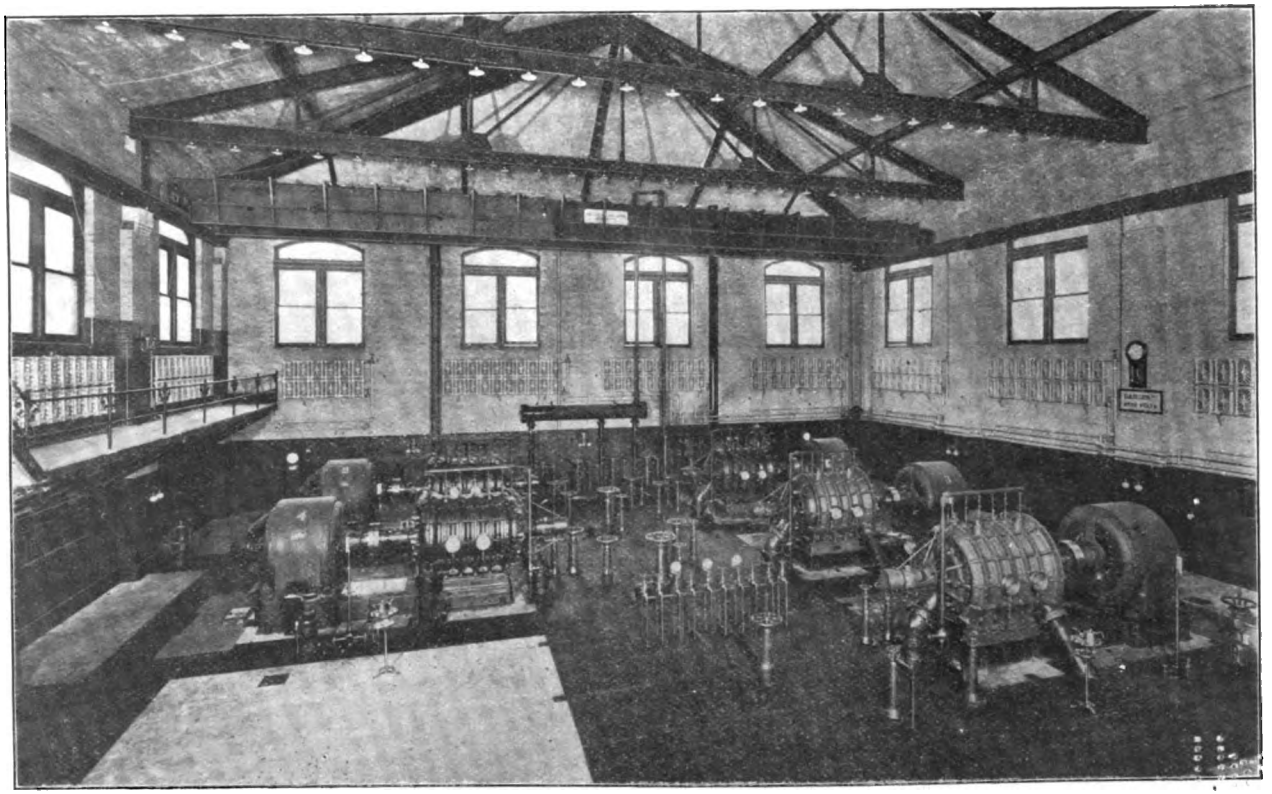
Digitized by Google



Interior Main High-pressure Fire Service Station, Furman and Joralemon Streets, Brooklyn, N. Y. Capacity, 16,500

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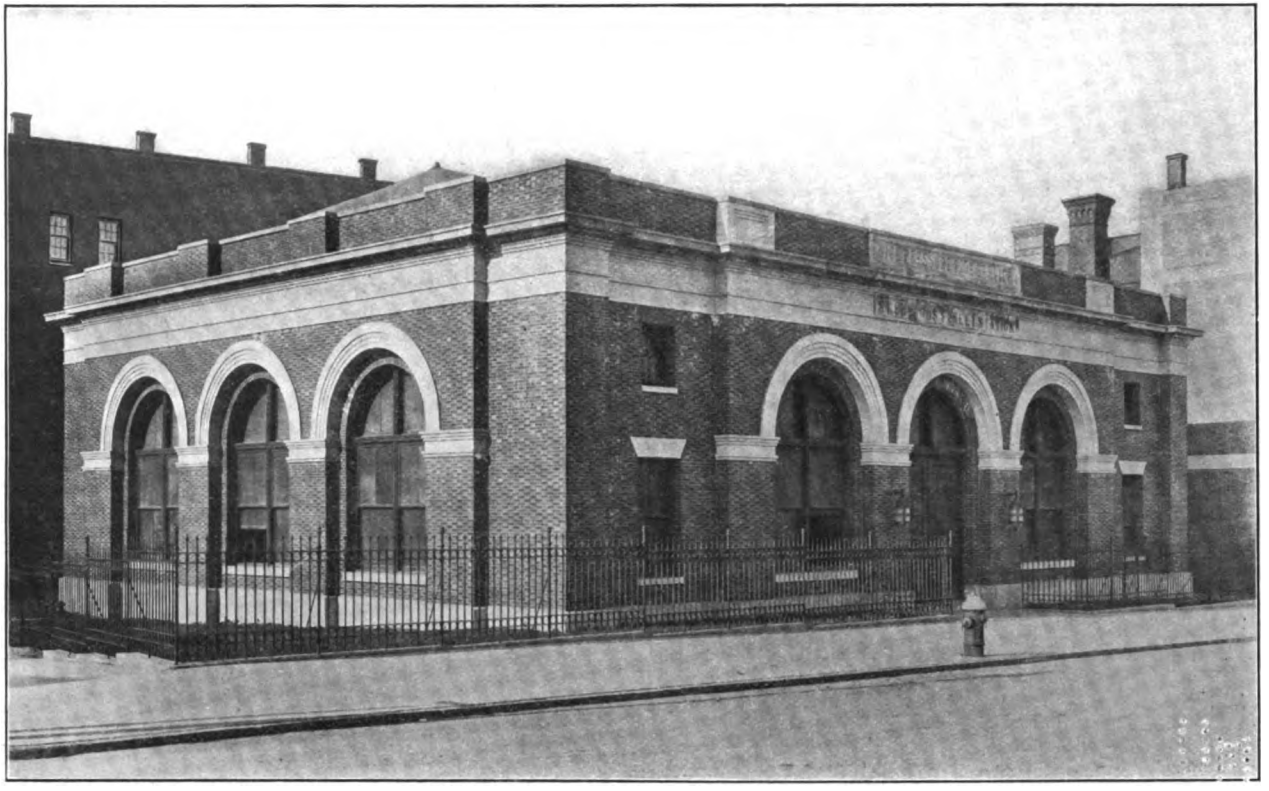
Digitized by Google



Reserve High-pressure Fire Service Station, Willoughby and St. Edwards Streets, Brooklyn, N. Y.

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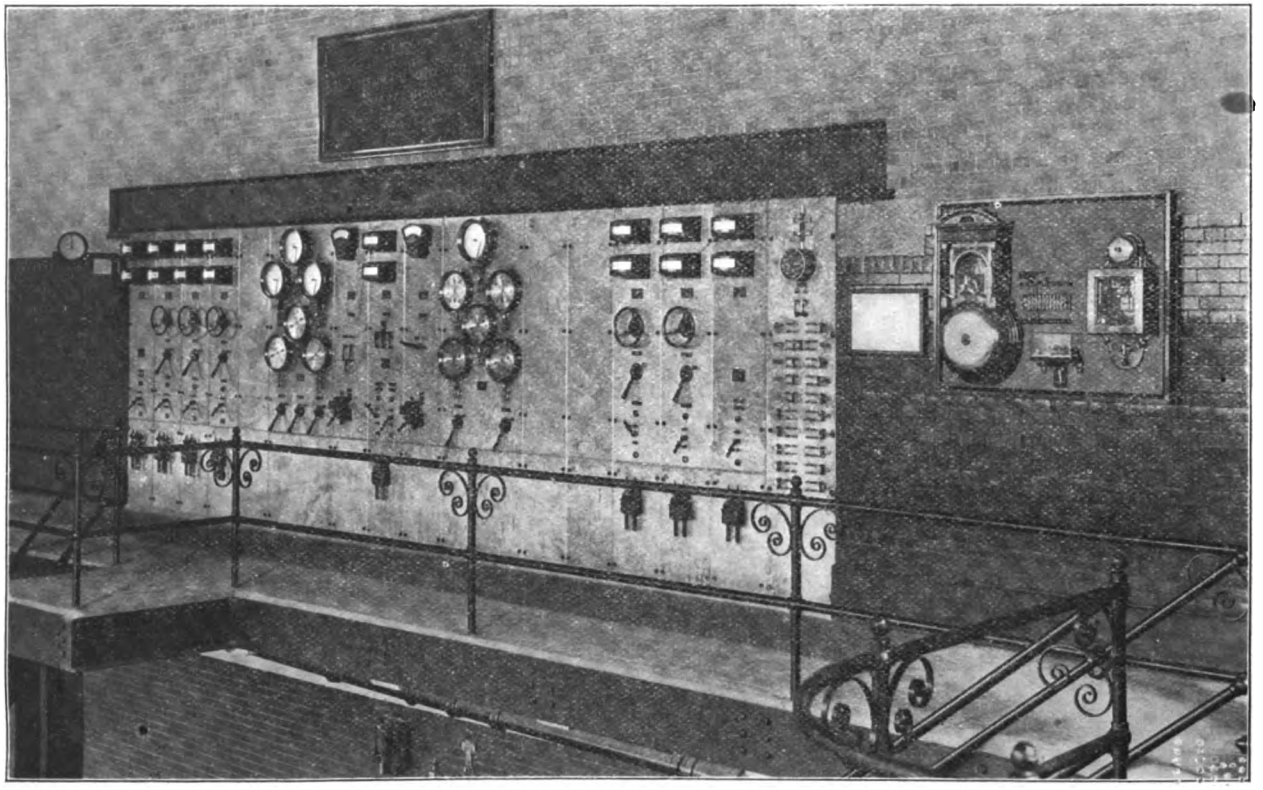

Operating Switchboard, Main High-pressure Fire Service Station, Brooklyn, N. Y.

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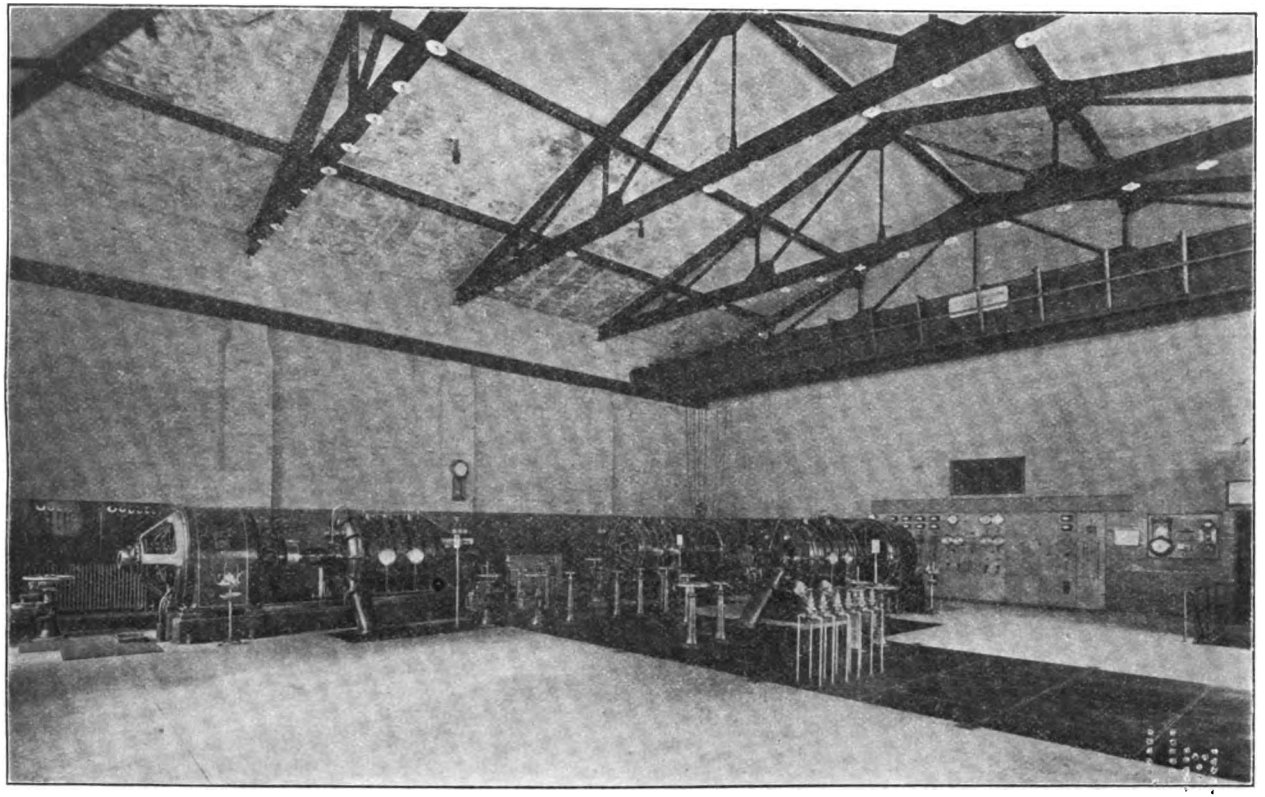

Interior of Reserve High-pressure Service Station, Willoughby and St. Edwards Streets, Brooklyn, N. Y.

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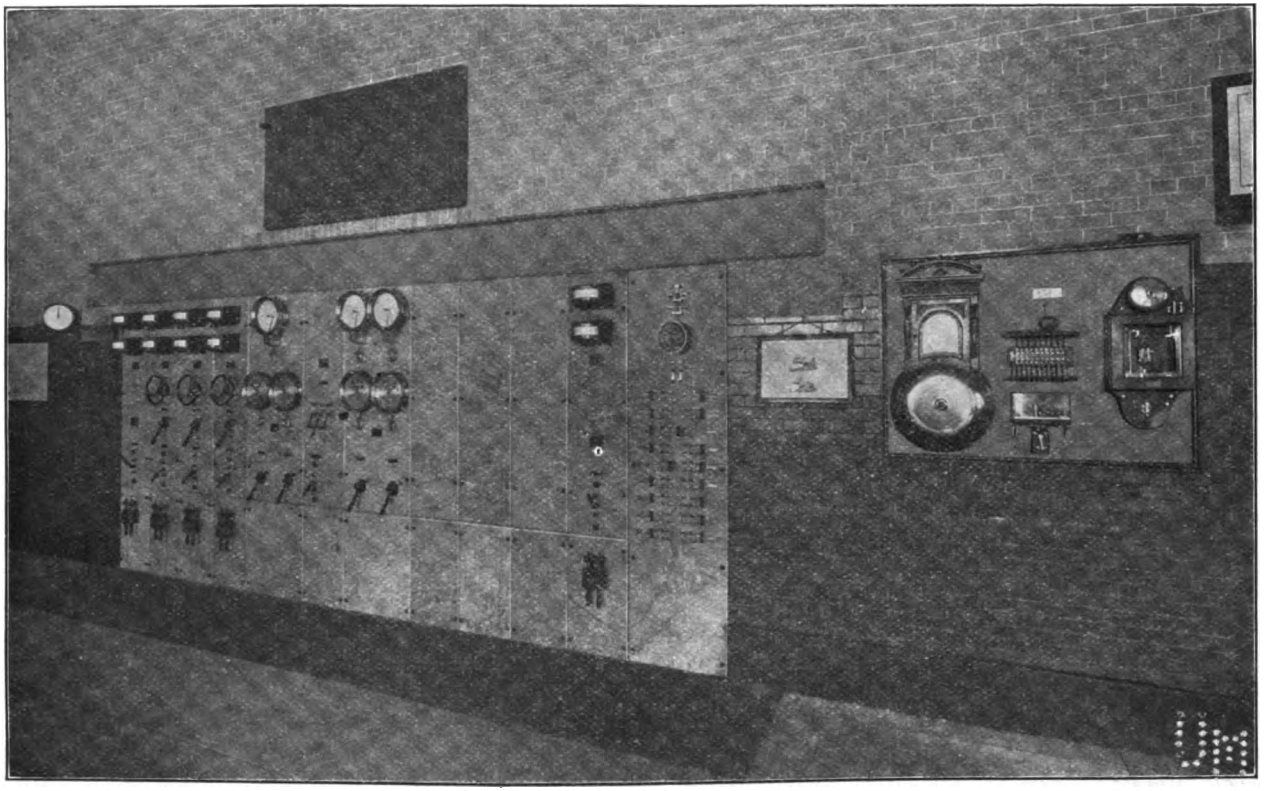

Operating Switchboard, Reserve High-pressure Fire Service Station, Brooklyn, N. Y.

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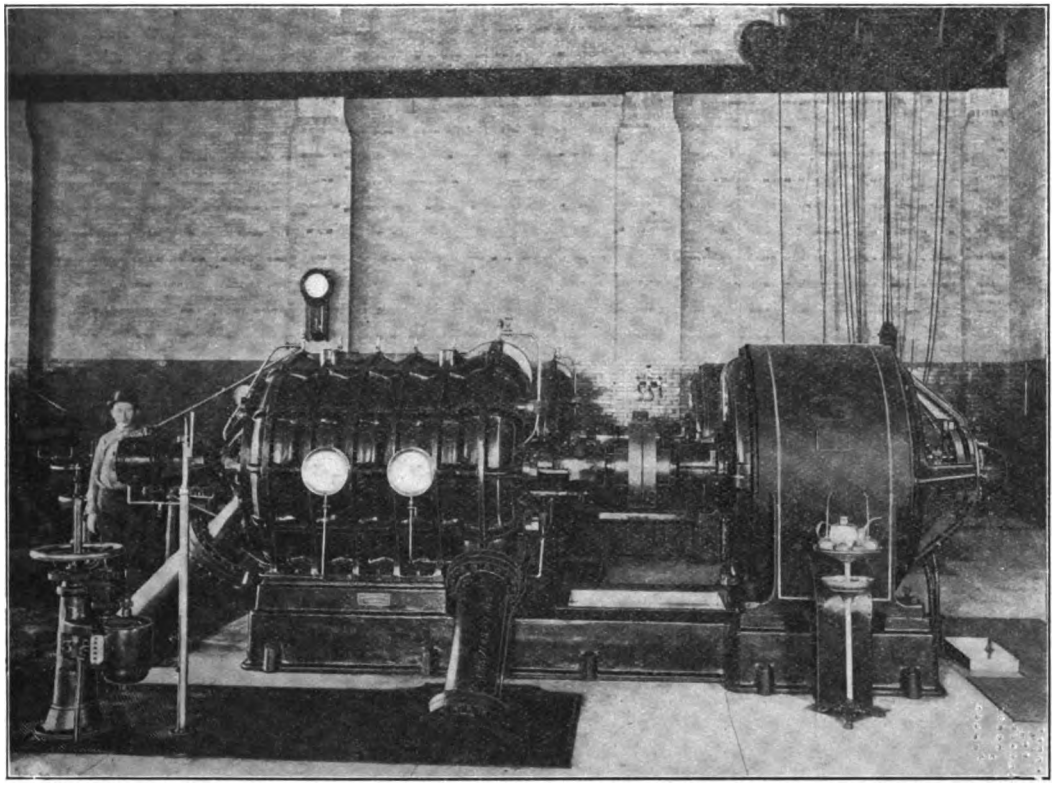

Motor-operated, High-tension Oil Switch Compartments, Reserve High-pressure Fire Service Station, Brooklyn, N. Y.

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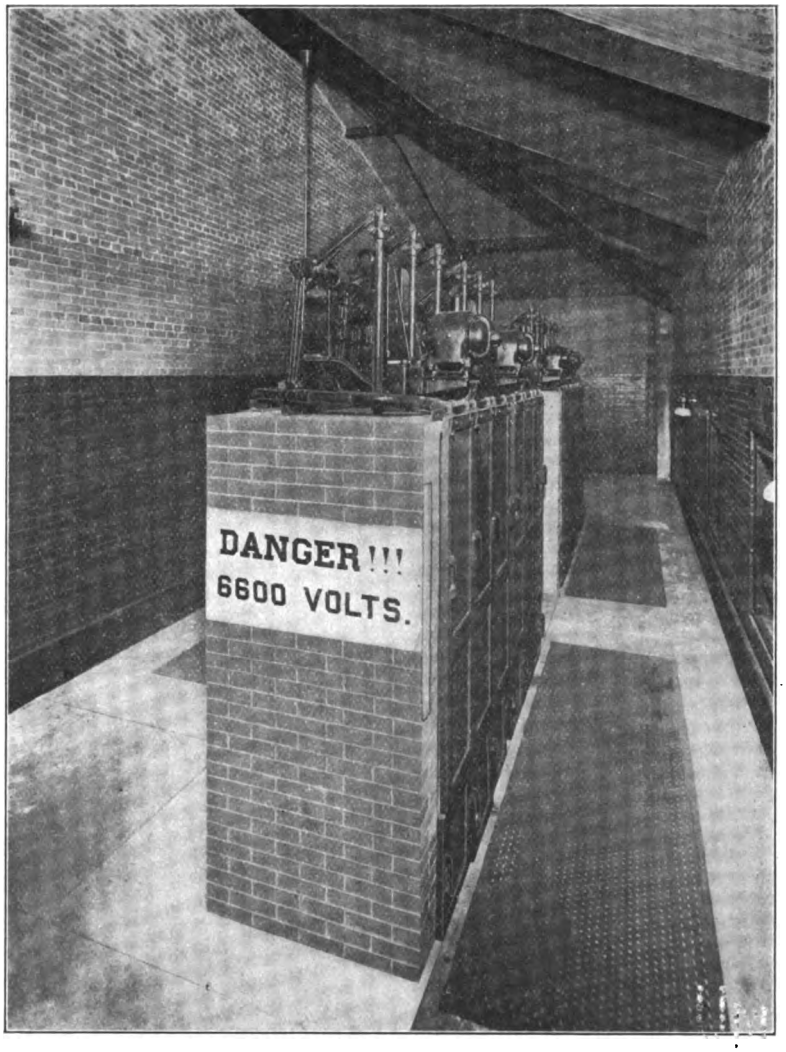


800 Horse-power, 6,600-volt, Induction Motor-driven 6-stage Turbine Pump, High-pressure Fire Service, Brooklyn, N. Y. Capacity 3,300 Gallons Per Minute Against 300 Pounds Per Square Inch.

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Department of Water Supply, Gas and Electricity,
Bureau of Water Register, Nos. 13 to 21 Park Row,
New York, April 6, 1909.

Hon. JOHN H. O'BRIEN, Commissioner, Water Supply, Gas and Electricity:

Dear Sir—I have the honor to report the collections of this Bureau for year ending December 31, 1908, as $6,203,954.45, an increase over the year 1907 of $36,230.96.

In addition to the foregoing, schedules of unpaid water rents amounting to $749,685.88 were transmitted to the Receiver of Taxes for collection. This is an increase of $446.672.59 over the amount returned as arrears in 1907. The large increase in arrears is due to the fact that the unpaid charges cover the period from October 1, 1906, to December 31, 1907, while the amount returned for collection in 1907 covers the period from October 1, 1905, to September 30, 1906. This naturally reduced the collections in this Bureau for year 1908, as a large part of the amount transmitted to the Receiver of Taxes for collection would have been collected in this office, if the amount returned as arrears in the year 1907 covered only the same period of time as in former years.

During the year 1908 a law was enacted, known as chapter 382 of the Laws of 1908, which provided for a uniform way of rendering average meter bills. This law has been of great assistance to the Department in adjusting and rendering such bills, as it has lessened the opportunity for complaint and saved the Department considerable trouble in adjusting complaints made against alleged excessive average charges, which has always been a source of annoyance to this Bureau.

Likewise a complete index of all metered properties has been instituted in this office, showing the section, block, lot and premises, and in what meter ledger the account is kept. The Department, previous to this time, had no uniform system of indexing the metered properties of this borough. This is a more thorough and comprehensive index.

There was also ordered a complete set of new ledgers. These ledgers are somewhat of an improvement over the ledgers formerly used in this office, and will provide a better check in safeguarding and protecting the City's interest, so that all charges for water actually due will be promptly rendered and paid. These ledgers were approved by the Committee on Revision of Accounts, as appointed by the Comptroller of this City, and are now being installed in this office.

Another great improvement has been the working of the rule that all meters out of order for any reason whatsoever must be repaired and reset within ten days from date of notice given to owner or occupant of premises. The proper enforcement of this rule has proven to be greatly advantageous to the Department in reducing considerably the number of days the meter is out of order and not registering and has therefore lessened the number of complaints as to excessive average bills.

Likewise it was found that there was no adequate means of keeping in touch with violations on work done by plumbers in setting and repairing meters. Upon

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my order, a card index system was instituted, which kept track of all such violations by licensed plumbers in this Borough. This index has been found to work greatly to the advantage of the Department, as now it is easily ascertained whether the plumber has violations against him and whether the work performed by him is satisfactory and in accordance with the rules and regulations of this Department. A plumber violating the rules is immediately suspended and no further permits are issued until said violations are removed.

The installation of meters in all places where stores are located, due to a reinspection of the City, was not pushed to the utmost extent, on account of the work of this Bureau being greatly behind. Owing to the large number of meters installed during 1906 and 1907, it was deemed advisable not to install as many meters during 1908, on account of the work being greatly behind owing to the large number of installations made in the years mentioned. This was done to enable the Department to bring the work of this Bureau, in inspecting meters, up to date, and the cleaning up of this work has greatly progressed during said period of time.

I discovered that the sealing of meters as practised in this Borough was totally inadequate and afforded absolutely no protection to the meters. At my suggestion, an entirely new system of sealing was advised and recommended, consisting of a specially made copper wire and lead disc. This affords absolute protection to the interior mechanism of the meter and prevents interference with same. Further, upon my orders, all meters leaving the pipe yard are now equipped with a new seal, and the necessary appropriation has been asked for the purpose of resealing all meters in the Borough of Manhattan. This appropriation has been granted and the work is now being performed.

Having found the testing plant at the foot of East Twenty-fourth street to be entirely inadequate for this Department and not competent to give proper tests of meters as desired, I have had installed two of the most up to date machines for testing meters of ⅝ inch to 2 inches in size, and there is at present in course of manufacture and installation a modern Mueller testing apparatus for meters of 3 inches to 12 inches. As soon as this work is completed, the City will have a thorough up to date testing plant.

Owing to the extreme care exercised in this office over the shipping hydrants and water used for shipping purposes, the opportunity for obtaining a supply of water without paying for same has been greatly lessened and very few violations of the Department rules exist along the river front throughout Greater New York. This has been accomplished through establishing an index system of all boats operating in and about this harbor.

Owing to the numerous omissions and erroneous readings made of meters in this Borough, the installation of a system was ordered whereby the Inspectors were directed to read meters upon printed slips, which merely contain the premises, style, size, number and location of meter. This has proven to be greatly advantageous and

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enables the Department to obtain an accurate and correct reading of meter on date inspected I feel this is a check toward obtaining correct index of meters.

I found that the system of complaints as inaugurated and performed in this office was entirely inadequate to the need therein and the delay attendant upon the answering of complaints was too great. Therefore a new system was instituted, which provided for the numbering of all correspondence received in this office and the answering of said correspondence by the different Bureau Divisions immediately upon receipt of same. At the present time, all complaints are answered promptly upon the date of their receipt, with the exception of a certain few which require special examinations and reports of various descriptions. In these cases the answer is made with as little delay as possible.

During the year there were 2,600 additional meters installed.

In past years, the records of this office were kept in a very unsatisfactory and chaotic condition, owing to the Department having no adequate means of filing said documents. Numerous up to date filing cabinets have been installed and the papers are now filed so as to be easily located and found when necessary.

This, however, has no relation whatsoever to the entire new steel furniture which is to be procured for this office, for which Revenue Bonds in the amount of $17,500 have been appropriated. When the new furniture is installed, this will be one of the most up to date offices and will afford absolute protection against fire and damage to the very important records maintained and kept in this office. At present the records have absolutely no protection whatsoever.

Respectfully,
M. C. PADDEN, Water Register.

Department of Water Supply, Gas and Electricity,
Bureau of Water Register, Nos. 13 to 21 Park Row,
New York, April 6, 1909.

Hon. JOHN H. O'BRIEN, Commissioner, Water Supply, Gas and Electricity:

Sir—I have the honor to submit a statement of moneys received in this Bureau for the year ending December 31, 1908, and placed to the credit of the respective accounts with the City Chamberlain, together with the accounts returned to the Bureau of Arrears:

| | First Quarter. | Second Quarter. | Third Quarter. | Fourth Quarter. | Total. |
|---|---|---|---|---|---|
| **Annual Rates—** | | | | | |
| **Principal** ..... | $41,510 04 | $656,413 15 | $1,391,759 15 | $205,926 50 | $2,295,608 84 |
| **Penalties** ..... | 5,355 10 | 5,865 18 | 7,998 11 | 13,382 85 | 32,601 24 |
| **Total** ..... | $46,865 14 | $662,278 33 | $1,399,757 26 | $219,309 35 | $2,328,210 08 |

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| | First Quarter. | Second Quarter. | Third Quarter. | Fourth Quarter. | Total. |
|---|---|---|---|---|---|
| Meter Rates— | | | | | |
| Buildings | $680,156 72 | $771,681 01 | $1,117,437 52 | $984,563 75 | $3,553,839 00 |
| Steamboats | 30,915 70 | 58,333 70 | 17,985 60 | 56,547 13 | 163,782 13 |
| Total | $711,072 42 | $830,014 71 | $1,135,423 12 | $1,041,110 88 | $3,717,621 13 |
| Permits— | | | | | |
| Building purposes | $5,303 81 | $14,303 06 | $11,458 03 | $15,142 60 | $46,207 50 |
| Extras, boilers, etc | 1,661 05 | 3,857 53 | 3,063 41 | 3,519 17 | 12,101 16 |
| Tugs, etc | 6,211 13 | 13,315 45 | 4,991 25 | 11,992 50 | 36,510 33 |
| Total | $13,175 99 | $30,976 04 | $19,512 69 | $30,654 27 | $94,818 99 |
| Street sprinkling | ..... | $3,999 75 | $3,999 75 | $2,666 50 | $10,666 00 |
| Taps | $984 50 | $1,581 00 | $1,680 00 | $1,494 00 | $5,739 50 |
| Meter Setting Fund No. 2. | $12,747 90 | $8,804 36 | $13,781 56 | $1,372 55 | $36,706 37 |
| Repairs, etc. (Bureau of Chief Engineer) | $2,604 23 | $2,581 62 | $1,574 55 | $3,431 98 | $10,192 38 |

| | |
|---|---|
| Total, 1908 | $6,203,954 45 |
| The total amount collected during the year 1907 was | 6,167,723 49 |
| Which shows an increase for the year 1908 of | $36,230 96 |

Returned to the Bureau of Arrears.

| | |
|---|---|
| Regular rates | $143,336 02 |
| Meter measurement | 501,595 67 |
| Meter Setting Fund No. 2 | 104,754 19 |
| | $749,685 88 |

Respectfully submitted,

M. C. PADDEN, Water Register.

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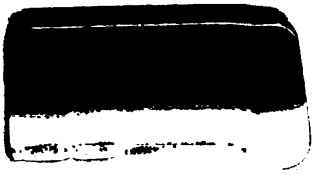

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